

Industrial Magnetic Metal Separation systems



Bakker Magnetics

Bakker Magnetics is a leading producer of products and industrial systems based on magnetism. Our research department is continuously investigating new applications for magnets and magnetic systems. Through use of modern, advanced computers and specialised software, complex calculations for magnets can be made very quickly. This means it is possible to design magnetic systems accurately for a wide range of applications optimally tuned to every specification. Because the development department uses CAD (Computer Aided Design) techniques, it can directly steer the factory when new products and systems are to be built. The development department also co-operates closely with scientific institutions such as universities when working on new developments or in new areas.

An integrated quality policy according to the ISO standards ensures the reliability of our products and systems - from research and development, logistics and production, through to marketing and after-sales service. Bakker Magnetics has been awarded the ISO 9001 certificate. Naturally, all Bakker Magnetics equipment meets the European machinery guidelines (CE).

Bakker Magnetics' head office is situated in Son, the Netherlands. From here, the development, manufacturing and marketing are managed for all the products and systems. Bakker Magnetics has an extensive network of dealers in all of Europe, the Far East and the United States as well as branches in Belgium, France, England, Norway and Spain.

This brochure contains information about our ferrous extraction and metal separation systems for industrial applications. These systems are of particular interest in two major areas - the food and feed industries and the waste and recycling industries. But they are also used in other sections of industry, for example, protecting machinery in the plastics industry from damage caused by random metal particles. In this catalogue you will find the standard range of systems from Bakker Magnetics. If you cannot find the exact answer to your problem with these, do not hesitate to contact us directly. Our technical people have many years of experience which guarantees you'll get the best solution to your problem.

TABLE OF CONTENTS

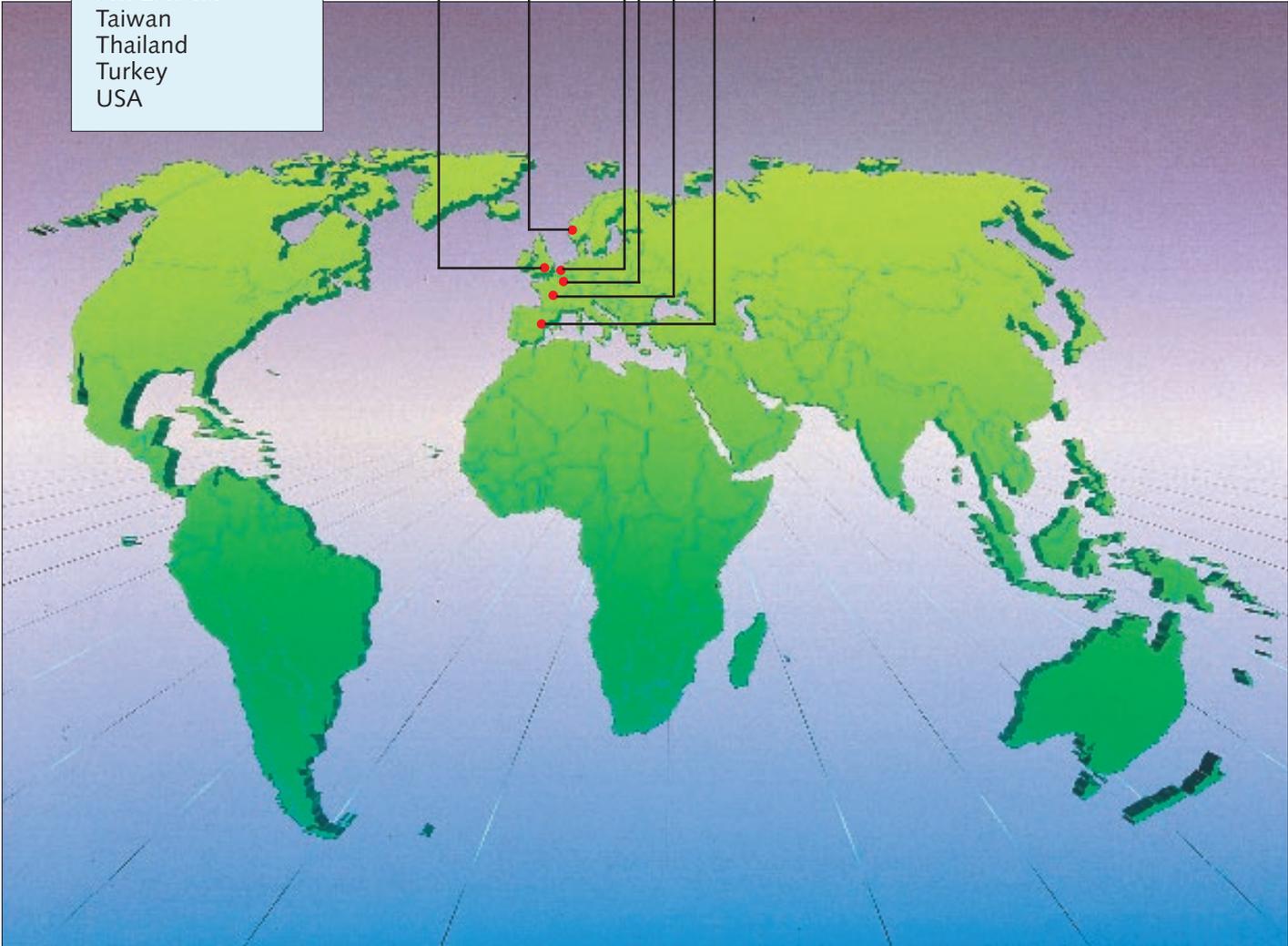
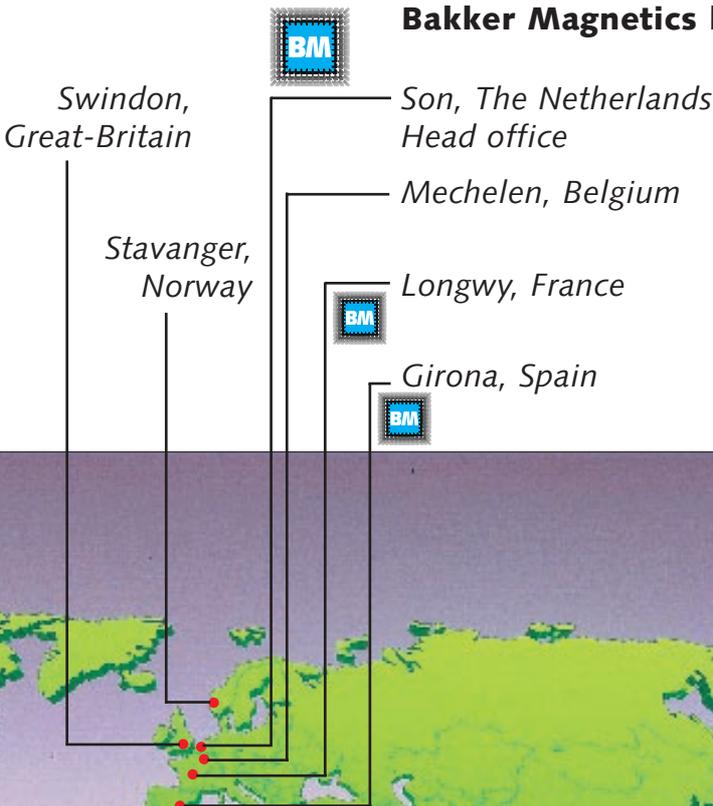
Bakker Magnetics Organisation	3
Quality	4
Industrial ferrous separation systems	5
Plate magnets	7
Tube magnet systems	10
Cascade magnet systems	14
Permanent magnetic filters	16
Permanent magnetic grids	18
Permanent magnetic filter bars	22
Metal separation systems for the waste and recycling industries	23
Overbeld magnet systems	24
Drum magnet	28
Head roller magnets	30
Block magnets	31
Eddy Current non ferrous separation systems	32
Metal detection and separation systems	34
Practical tips	36
Bakker Magnetics product range	38



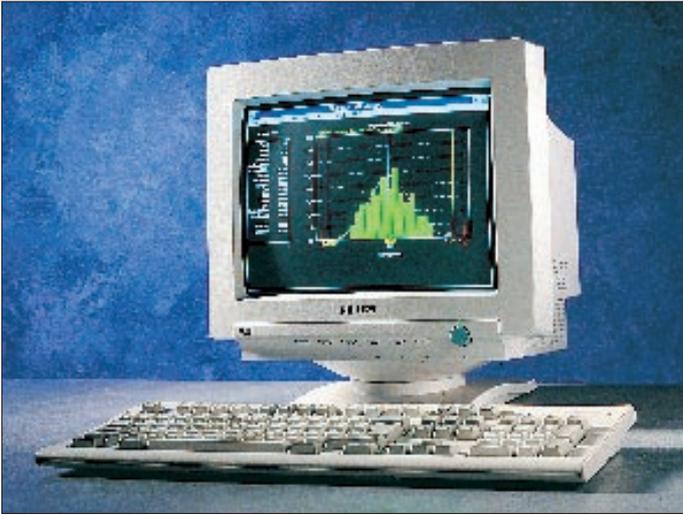
Worldwide distribution

- Argentina
- Australia
- Austria
- Belgium
- Denmark
- Finland
- France
- Germany
- Great Britain
- Hong Kong
- Israel
- Italy
- Japan
- Malaysia
- Norway
- Philippines
- Portugal
- Singapore
- South Africa
- Spain
- Sweden
- Switzerland
- Taiwan
- Thailand
- Turkey
- USA

Bakker Magnetics branches



Bakker Magnetics' quality system



Statistical Process Control in various stages of the production process

Integrated quality control has a very high priority in the Bakker Magnetics' organisation. This is evident from its products and systems. It also includes the services - from development to after-sales - and Bakker Magnetics was the first company in its field to be awarded the ISO 9001 certificate. From a very early stage, people were convinced that it was of strategic importance that the whole range of products and systems meet the most stringent quality standards. For our ferrous separation systems, this not only means that the various systems very accurately match the specifications but also that the materials and construction used meet the most stringent durability and reliability requirements. The magnet systems used in the Bakker Magnetics' ferrous separation systems are built from carefully selected magnetic materials which means we can guarantee the magnetic properties for the entire life of the magnetic parts in a number of cases. In addition, using advanced computer systems to perform the calculations ensures that the magnetic systems do their job properly.

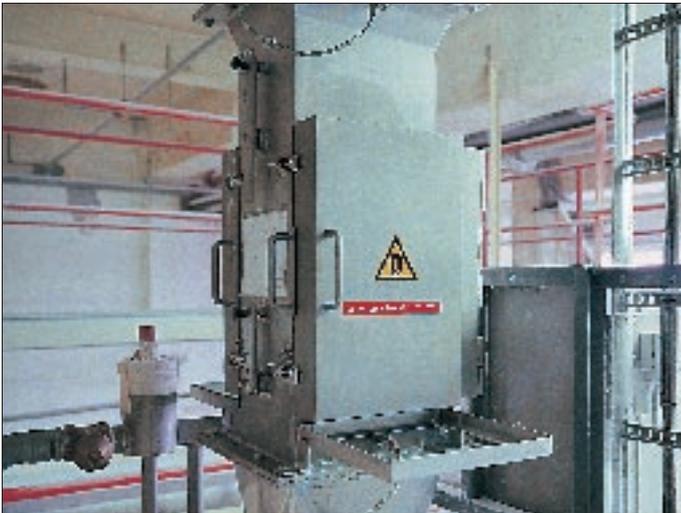


Permagraph for the analysis of the magnetic properties of material

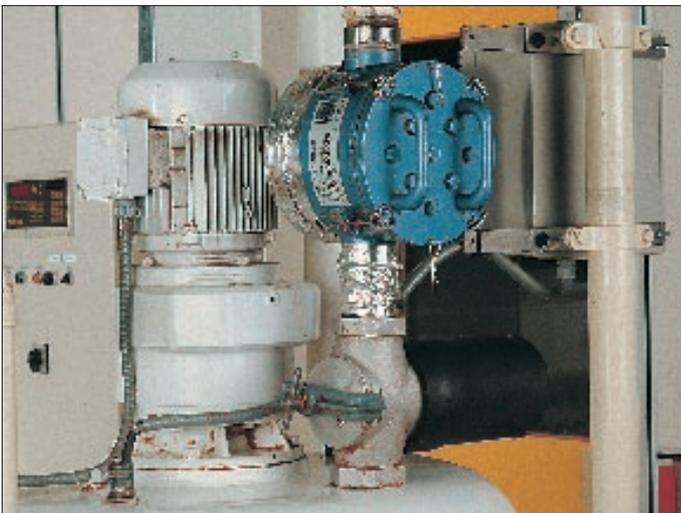
BM Industrial ferrous separation systems



Bakker Magnetics Magbox ferrous separation system in the feed industry



Bakker Magnetics external chute magnet in the transport system for bulk goods



Bakker Magnetics magnetic filter in the chocolate industry (double walled version)

Iron is probably one of the most common materials in industry. But the presence of iron particles in raw materials, components or semi-finished products is totally unacceptable especially in the food and confectionery industries. In most industrial processes, great care is taken to remove any unwanted ferrous contamination as thoroughly as possible. It seems obvious to state that this can be done with magnetism. One of the things Bakker Magnetics has specialised in is the development and manufacture of industrial systems for removing ferrous contamination. The company's development department has been involved for many years now with industries facing the problems of ferrous contamination. This effort has resulted in a great deal of know-how and the production of a wide range of highly specialised systems.

Raw materials can become contaminated with ferrous particles in many different ways. Shavings from milling operations, nuts and bolts that have vibrated free, burrs which have become detached from the metal components in transportation systems are just a few examples of the ways that contamination can occur. A universal solution for removing ferrous particles from all raw materials irrespective of the manufacturing system hasn't been discovered yet. The best solution for a specific problem is nearly always custom-made. For ferrous separation systems, we can identify a number of basic principles for particular systems and/or products each with its own characteristics. In addition, there is an extensive range of possibilities for the magnet systems themselves each of which influences the process in some way. In the standard specification, all systems are supplied with ceramic magnets. For extracting particles in the μ -region, the systems can be equipped with Neodymium magnets. In general it can be said that the best place for separating ferrous metals from raw materials in almost every situation is the transportation system. An efficient ferrous removal system can perform effectively without creating any noticeable delay to the production process. Bakker Magnetics also has a broad range of manual and automatic facilities for cleaning the ferrous separation systems.

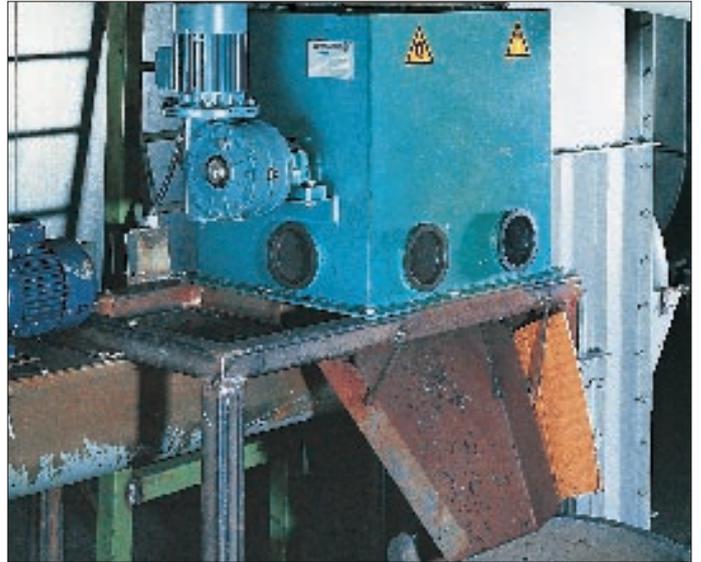
Sanitary models

Various Bakker Magnetics ferrous separation systems can be supplied in sanitary models which are especially suitable for the food industry and other applications where stringent hygiene standards are demanded. The sanitary systems are manufactured entirely from AISI 304 stainless steel, or they can be supplied in AISI 316 stainless steel if required. Particular attention has been paid to the surface treatment (stainless inside and outside). All of them are supplied with flanges conforming to the DIN 2576 ND 10 standard. Great care is taken during the design and manufacturing stages so that it is almost impossible for excess material to collect anywhere.

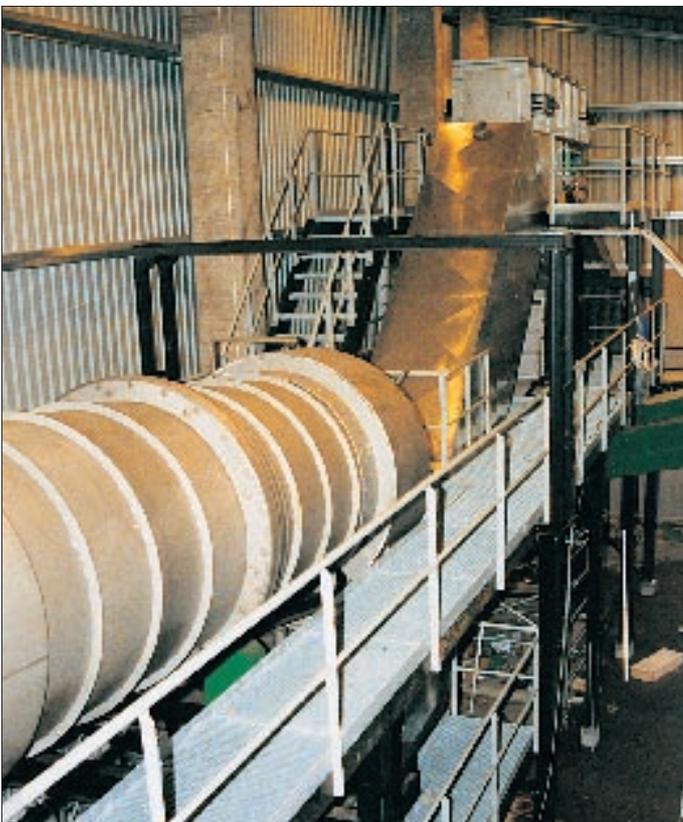
Some applications of BM metal separation systems



Drum magnet in use for mineral extraction



Removal of iron from rubber granulate in the recycling of car tyres

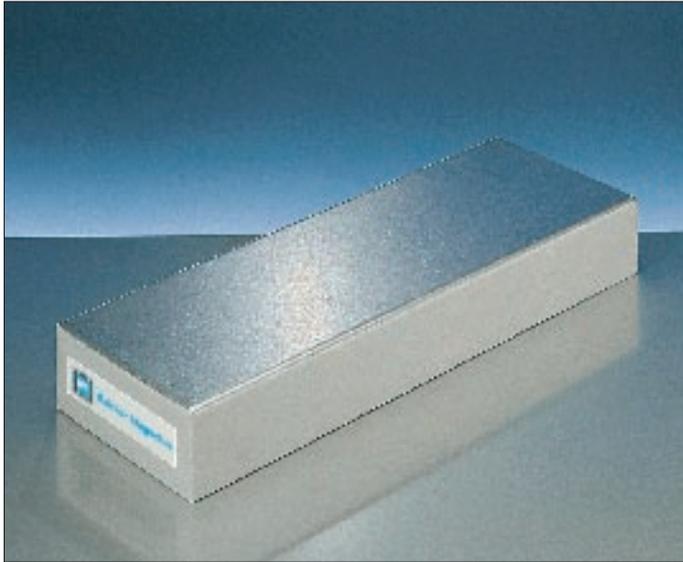


Overband magnet system in a cryogenic installation



Pipe magnet in the flour industry

BM Plate magnets



Bakker Magnetics Plate magnets, type FDA

Plate magnets are used for removing ferrous materials from material flows on conveyor belts, during free-fall, in vertical or sloping pipelines, under chutes and slides, etc.

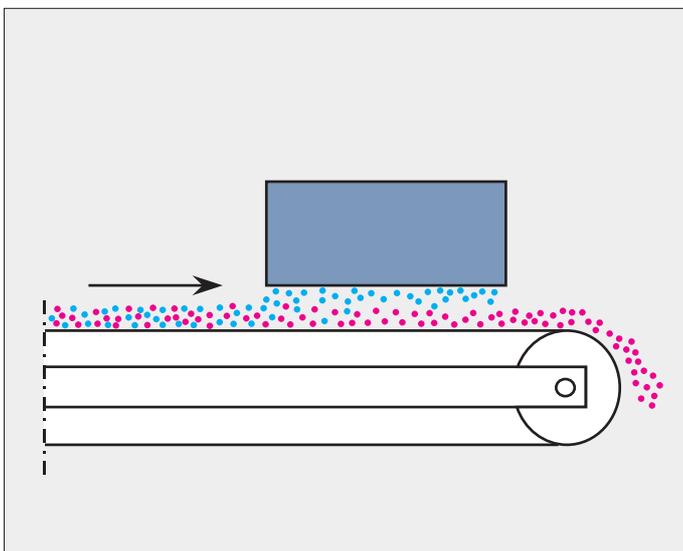
Plate magnets, type FDA

This type of plate magnet is fitted with powerful ceramic magnets mounted in such a way that an extra strong, deep magnetic field is generated (see table). The surfaces of the magnet that can come in contact with the material flow are made of stainless steel (AISI 304). This type of plate magnet is fitted with a steel plate on the rear with threaded holes for installation. The standard range includes magnets in a large number of different sizes - almost any size can be supplied on order. To make cleaning the plate magnets quick and thorough, they can be supplied with a cleaning tray which can be either manually or pneumatically operated. The pneumatic operation could be used to advantage when the magnet is installed in a position that is difficult to reach. The pneumatic operation meets all ISO and CETOP standards.

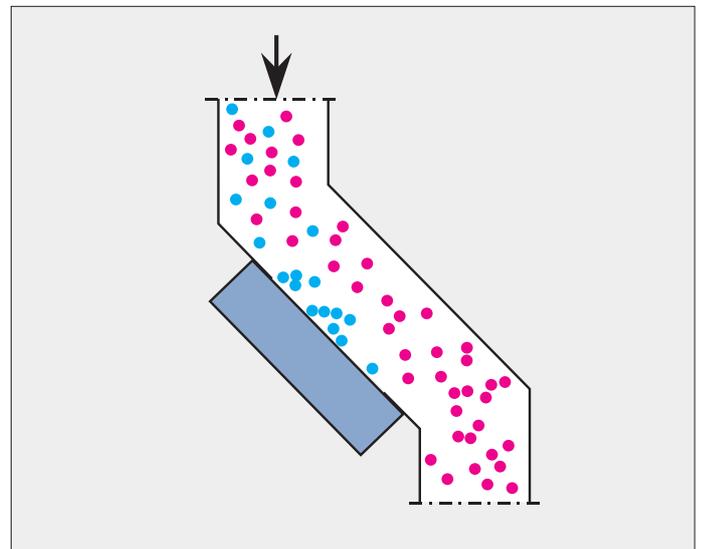
Depth of effective magnetic field - plate magnets

Art.no	bar ø 5x25	bar ø 5x75	nut M16
70.050 t/m 70.052	50	70	45
70.053 t/m 70.056	70	90	55
70.057 t/m 70.066	75	100	60
70.067 t/m 70.068	80	105	65
70.069 t/m 70.072	155	200	125
24.001 t/m 24.020	115	155	95
24.050 t/m 24.061	110	125	85

All dimensions in mm



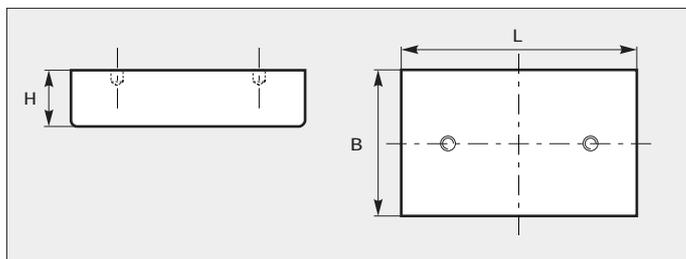
FDA plate magnets above material on a conveyor belt



In this application, the material flow comes directly in contact with the plate magnet.

BM Plate magnets

Plate magnets, type FDA, with ceramic magnet systems



Art.no.	L	B	H	dimension holes	hole pitch between centres	weight (kg)
BM 70.050	75	75	30	2xM8x10	50	1,0
BM 70.051	275	75	30	2xM8x8	250	3,7
BM 70.052	340	75	30	2xM8x8	250	3,5
BM 70.053	105	105	30	2xM8x8	50	1,9
BM 70.054	210	105	30	2xM8x8	100	3,9
BM 70.055	310	105	30	2xM8x8	200	5,7
BM 70.056	340	105	30	2xM8x8	250	6,3
BM 70.057	145	105	50	2xM8x8	100	3,8
BM 70.058	210	105	50	2xM8x8	100	5,6
BM 70.059	280	105	50	2xM8x8	200	7,4
BM 70.060	310	105	50	2xM8x8	200	8,2
BM 70.061	345	105	50	2xM8x8	250	9,2
BM 70.062	410	105	50	3xM8x8	150	10,9
BM 70.063	445	105	50	3xM8x8	150	11,8
BM 70.064	510	105	50	3xM8x8	200	13,6
BM 70.065	610	105	50	4xM8x8	150	16,2
BM 70.066	765	105	50	4xM8x8	200	20,3
BM 70.067	280	180	90	2xM12x10	200	23,5
BM 70.068	400	180	90	3xM12x10	150	33,5
BM 70.069	345	280	95	3xM12x15	100	43,5
BM 70.070	545	280	95	4xM12x15	150	69,0
BM 70.071	610	280	95	4xM12x15	150	77,5
BM 70.072	815	280	95	4xM12x15	200	103,0

BM 24.001	100	205	88	2xM10x25	50	8,5
BM 24.002	125	205	88	2xM10x25	75	10,0
BM 24.003	150	205	88	2xM10x25	100	12,5
BM 24.004	200	205	88	2xM10x25	100	16,5
BM 24.005	250	205	88	2xM10x25	150	21,0
BM 24.006	300	205	88	2xM10x25	200	25,0
BM 24.007	350	205	88	2xM10x25	250	29,0
BM 24.008	400	205	88	2xM10x25	300	33,0
BM 24.009	450	205	88	2xM10x25	350	37,5
BM 24.010	500	205	88	2xM10x25	400	41,5
BM 24.011	550	205	88	3xM10x25	225	45,5
BM 24.012	600	205	88	3xM10x25	250	50,0
BM 24.013	650	205	88	3xM10x25	275	54,0
BM 24.014	700	205	88	3xM10x25	300	58,0
BM 24.015	750	205	88	3xM10x25	325	62,0
BM 24.016	800	205	88	3xM10x25	350	66,5
BM 24.017	850	205	88	3xM10x25	375	71,0
BM 24.018	900	205	88	3xM10x25	400	75,0
BM 24.019	950	205	88	3xM10x25	425	79,0
BM 24.020	1000	205	88	4xM10x25	300	83,0

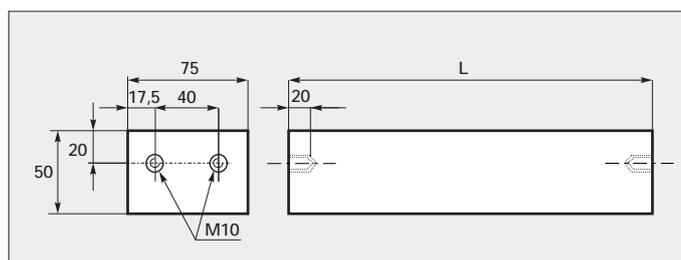
Plate magnets, type FDA, with Neodymium magnet systems

Plate magnets equipped with the powerful Neodymium magnetic material are used when a relatively large depth of magnetic field is needed. This can be the case, for example, when very small ferrous particles ($< 5 \mu$) have to be separated from material flows. For the effective magnetic field depth, see the table on page 7.

Art.no.	L	B	H	dimension holes	hole pitch between centres	weight (kg)
BM 24.050	50	104	41,5	2xM6x20	30	1,6
BM 24.051	92	104	41,5	2xM8x20	50	2,9
BM 24.052	134	104	41,5	2xM8x20	75	4,3
BM 24.053	176	104	41,5	2xM8x20	100	5,6
BM 24.054	218	104	41,5	2xM8x20	100	7,0
BM 24.055	260	104	41,5	2xM8x20	150	8,3
BM 24.056	302	104	41,5	2xM10x20	200	9,7
BM 24.057	344	104	41,5	2xM10x20	250	11,0
BM 24.058	386	104	41,5	2xM10x20	250	12,4
BM 24.059	428	104	41,5	2xM10x20	300	13,7
BM 24.060	470	104	41,5	2xM10x20	350	15,0
BM 24.061	512	104	41,5	2xM10x20	400	16,4

Plate magnets, type FDB

This type of plate magnet is normally used to remove ferrous particles from raw materials during textile production.



Art.no.	L	weight (kg)
BM 24.100	1000	30
BM 24.101	1850	55
BM 24.102	2350	70
BM 24.103	2850	84
BM 24.104	2950	87

All dimensions in mm

BM Plate magnets

Plate magnets, type FDL



Bakker Magnetics plate magnet type FDL

FDL type plate magnets are used for separating iron from less severely contaminated materials. To ensure a robust construction and flexible mounting possibilities, this type of magnet is built with a steel omega profile. This means the magnets also have flanges on which hinges or locks can be mounted. The surface that comes in contact with the material flow is wear resistant. On special order, the magnets can also be supplied with a stainless steel cover for the magnetic surface. The FDL type plate magnets can be supplied in three models:

FDL: flat plate magnet

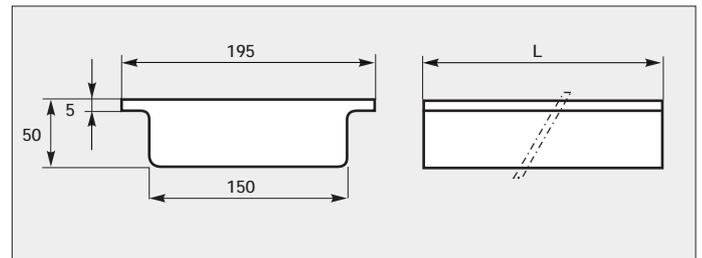
FDL/C: plate magnet with inclined pole so that the ferrous particles are collected behind the raised edge of the pole

FDL/V: plate magnet equipped with 'fingers' to give an especially thorough separation of ferrous particles

The standard range of FDL plate magnets can be supplied in a large number of different sizes. However, almost any length and width is available on special order.



Bakker Magnetics plate magnet type FDL/V

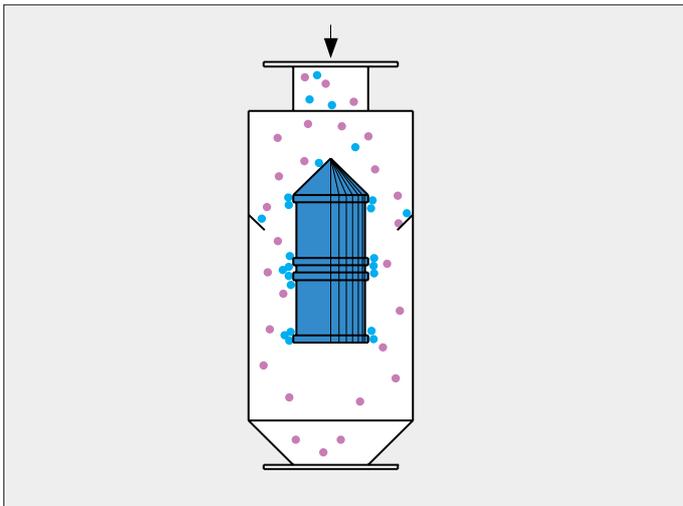


length	FDL Art.no.	weight (kg)	FDL/V Art.no.	weight (kg)	FDL/C Art.no.	weight (kg)
100	BM 21.001	12,8	BM 22.001	3,2	BM 23.001	3,2
125	BM 21.002	23,5	BM 22.002	4,0	BM 23.002	4,0
150	BM 21.003	34,2	BM 22.003	4,8	BM 23.003	4,8
200	BM 21.004	45,6	BM 22.004	6,4	BM 23.004	6,4
250	BM 21.005	57,0	BM 22.005	8,0	BM 23.005	8,0
300	BM 21.006	68,4	BM 22.006	9,6	BM 23.006	9,6
350	BM 21.007	79,8	BM 22.007	11,2	BM 23.007	11,2
400	BM 21.008	11,2	BM 22.008	12,8	BM 23.008	12,8
450	BM 21.009	12,6	BM 22.009	14,4	BM 23.009	14,4
500	BM 21.010	14,0	BM 22.010	16,0	BM 23.010	16,0
550	BM 21.011	15,4	BM 22.011	17,6	BM 23.011	17,6
600	BM 21.012	16,8	BM 22.012	19,2	BM 23.012	19,2
650	BM 21.013	18,2	BM 22.013	20,8	BM 23.013	20,8
700	BM 21.014	19,6	BM 22.014	22,4	BM 23.014	22,4
750	BM 21.015	21,0	BM 22.015	24,0	BM 23.015	24,0
800	BM 21.016	22,4	BM 22.016	25,6	BM 23.016	25,6
850	BM 21.017	23,8	BM 22.017	27,2	BM 23.017	27,2
900	BM 21.018	25,2	BM 22.018	28,8	BM 23.018	28,8
950	BM 21.019	26,6	BM 22.019	30,4	BM 23.019	30,4
1000	BM 21.020	28,0	BM 22.020	32,0	BM 23.020	32,0

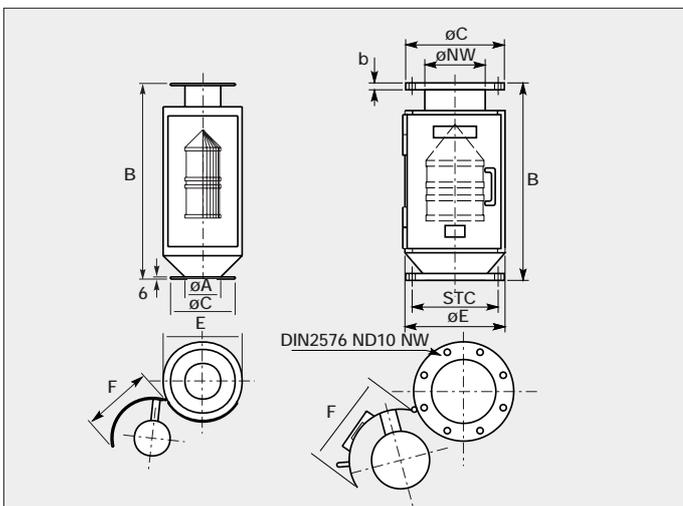
All dimensions in mm



Bakker Magnetics permanent tube magnets.



The ferrous particles extracted from the flow are collected behind the pole plates.



Left: BM 26.010... Right: BM 26.120...

Pipe magnet systems

Permanent tube magnets are used where manual cleaning is possible. A guide strip is fitted to the inside of the housing which ensure that the material to be cleaned is well dispersed when it comes in contact with the magnetic core. The casing for this type of tube magnet has a hermetically sealed door which gives access to the magnetic core for cleaning. For the standard range, the casing is made from 4 mm thick steel. A stainless steel (AISI 304) model can be supplied on special order and then "/10" is added to the type number. In addition, the range can be supplied in sanitary models. These are particularly suitable for use in situations where the most stringent hygiene requirements are set for the raw materials to be processed. On request, there is a model that can be supplied for use under pressure. As well as the standard flange sizes, tube magnets can also be supplied with flanges meeting the customer's specifications. Separate magnets are available for mounting in existing casings.

Art.no.	A	B	C	E	F	capacity (t/u)**	weight (kg)
BM 26.010	100	550	180	220	240	6	25
BM 26.011	150	600	230	275	310	20	39
BM 26.012	200	650	280	345	405	50	91
BM 26.013	250	750	330	430	490	75	127
BM 26.014	300	850	400	485	550	100	171
BM 26.015	400	950	500	620	665	150	286
BM 26.016	500	1100	600	780	770	200	480

Sanitary model of a tube magnet system with DIN 2576 ND10 flanges*

Standaard uitgevoerd met keramische magneetsystemen. Voor uitvoeringen met Neodymium magneetsystemen "/01" aan art.nr. toevoegen.

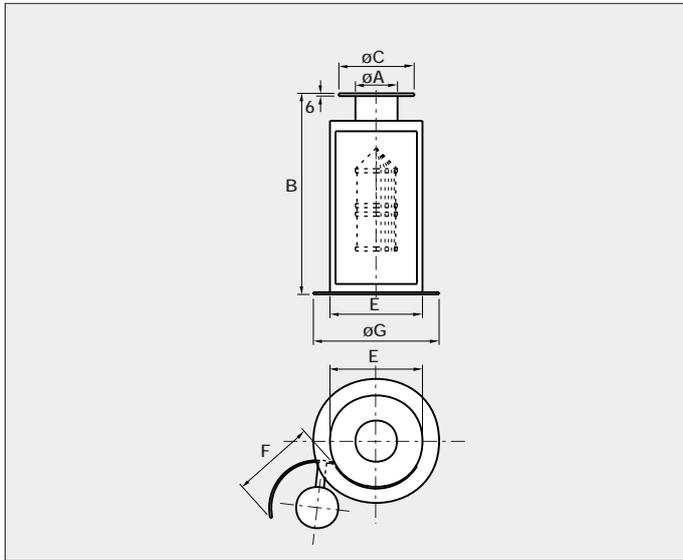
Art.no.	NW	B	C	E	F	capacity (t/u)**	weight (kg)
BM 26.120	100	578	220	220	240	6	36
BM 26.121	150	632	285	275	310	20	60
BM 26.122	200	686	340	345	405	50	104
BM 26.123	250	790	395	430	490	75	156

All dimensions in mm

** applies to dry, granular materials

* see table on page 37

BM Tube magnet systems



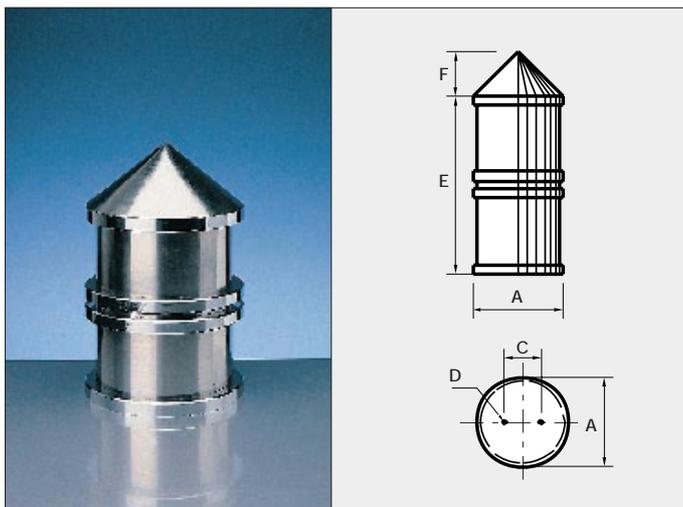
Tube magnets without outlet cone

Tube magnets without outlet cone

For applications where there is not much room available, Bakker Magnetics tube magnets can be supplied without the lower cone. Because of their reduced height, there are more possible places where they can be installed. Their mechanical characteristics are identical to the range equipped with the bottom cone. A stainless steel (AISI 304) version can be supplied to special order. In this case, the article number has "/10" added to it.

Art.no.	A	B	C	E	F	G	capacity (t/h)*	weight (kg)
BM 26.110	100	490	180	220	240	300	6	22
BM 26.111	150	538	230	275	310	355	20	35
BM 26.112	200	578	280	345	405	425	50	87
BM 26.113	250	660	330	430	490	510	75	121
BM 26.114	300	757	400	485	550	585	100	164
BM 26.115	400	840	500	620	665	720	150	275
BM 26.116	500	960	600	780	770	880	200	475

* applies to dry, granular materials



Separate permanent magnetic cores

Separate permanent magnetic cores

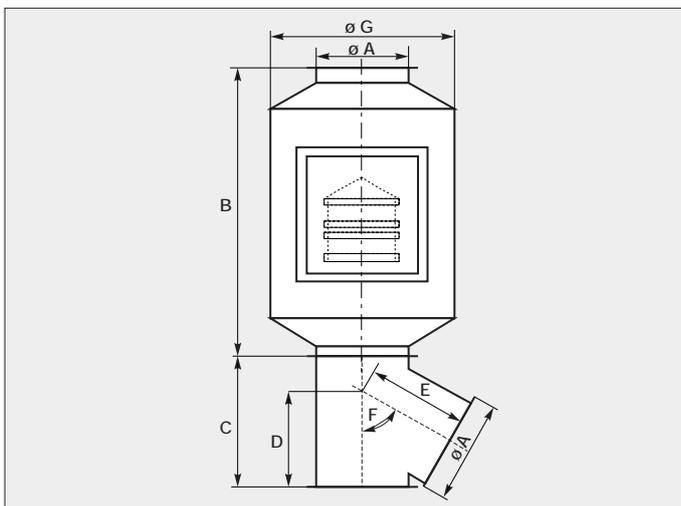
Supplied as standard with ceramic magnet systems. For versions equipped with Neodymium magnet systems, add "/01" to the article number.

Art.no.	A	C	D	E	F	weight (kg)
BM 26.020	100	40	M6	211	43	7
BM 26.021	150	50	M8	189	65	16
BM 26.022	200	80	M8	249	87	48
BM 26.023	250	90	M8	295	109	70
BM 26.024	300	100	M10	363	132	104
BM 26.025	400	150	M10	383	176	207
BM 26.026	500	200	M10	432	220	347

All dimensions in mm

Electro tube magnets

A range of self-cleaning, remotely controllable electro-magnetic tube magnet systems are available for inclusion in automated industrial systems. More information about these electromagnetic systems is available on request.



Electromagnetic tube systems

Art.no.**)	A	B	C	D	E	F	G	power (W)	cap. (t/h)
BM 26.501	100	550	180	120	120	60°	220	30	6
BM 26.502	150	620	260	150	150	60°	275	50	20
BM 26.503	200	750	410	267	267	60°	345	130	50
BM 26.504	250	850	425	270	270	60°	430	300	75
BM 26.505	300	900	505	385	385	50°	485	450	100
BM 26.506	400	1050	700	530	530	50°	620	750	150
BM 26.507	500	1200	890	660	660	50°	780	1100	200

All dimensions in mm

** add /10 for stainless steel housing

Chute magnets

For a number of applications, chute magnet systems have a number of advantages especially when removing metal contamination from powdered raw materials since the chance of bridge building is practically zero. This type is also very suitable for removing ferrous contamination from material flows containing larger particles, for example, shredded wood or plastic. Cleaning the system is relatively simple. Bakker Magnetics chute magnet systems are equipped with powerful FDA/C plate magnets. The casing is stainless steel and has flat, unbored flanges. The systems can also be supplied in a steel housing. For installation in environments where the most stringent hygiene standards are required, this type can also be supplied in a sanitary model. Optionally, Bakker Magnetics external chute magnet systems can be fitted with two stainless intermediate plates which hinge with the door to make the cleaning of the system appreciably easier. There is also a version with a cleaning tray that can be supplied.



BM 26.200...

Sanitary model

Various Bakker Magnetics ferrous separation systems are available in so-called sanitary models. These models are particularly suitable for the food industry and other applications in which high standards of hygiene are required. The sanitary systems are fabricated entirely from AISI 304 stainless steel. If required, they can also be made in AISI 316 stainless steel. Particular attention has been paid to the surface treatment (stellated inside and outside). All sanitary models are fitted with flanges meeting the standard DIN 2576 ND 10. Both in the design and in the manufacture, great care is taken to ensure that it is almost impossible for material residue to accumulate.

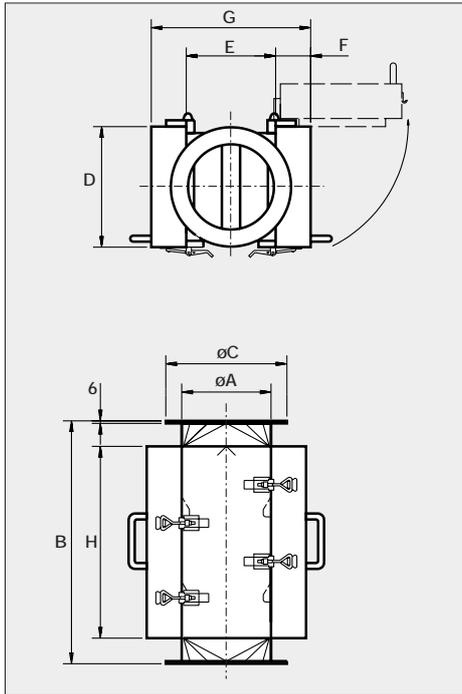


BM 26.220...

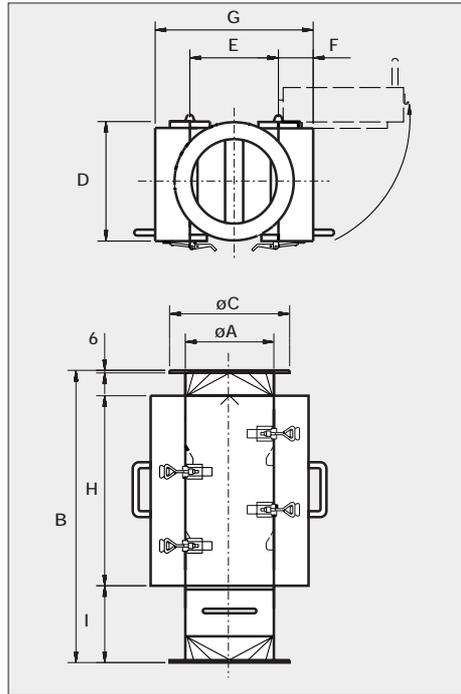


BM 26.220... with stainless steel separators

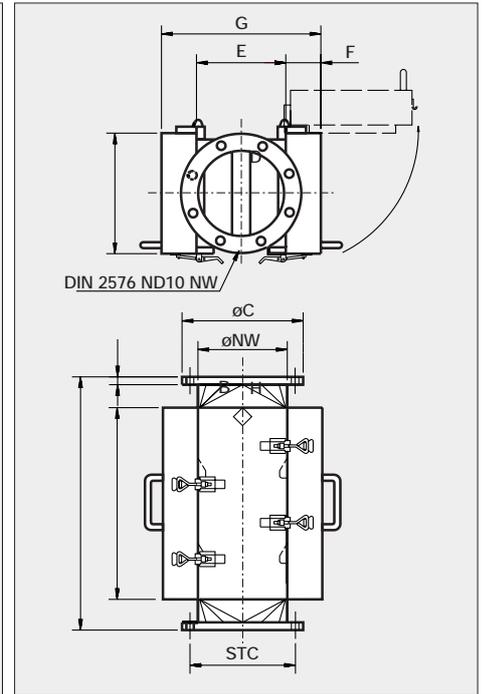
BM Pipe magnet systems



BM 26.210...



BM 26.200...



BM 26.220...

Equipped as standard with ceramic magnet systems. For versions with Neodymium magnet systems, add "/01" to the article number.

Chute magnet systems, standard model

Art.no.	A	B	C	D	E	F	G	H	weight (kg)
BM 26.210	100	400	180	183	108	29,5	167	294	27
BM 26.211	150	480	230	233	158	51,5	261	372	57
BM 26.212	200	570	280	283	208	81,5	371	450	115
BM 26.213	250	690	330	333	258	102,7	463,4	556	205
BM 26.214	300	695	400	383	308	102,7	513,4	546	260

Chute magnet systems with cleaning tray

Art.no.	A	B	C	D	E	F	G	H	I	weight (kg)
BM 26.200	100	480	180	153	106	29,5	165	256	155	31
BM 26.201	150	600	230	203	156	49,5	255	352	184	67
BM 26.202	200	700	280	253	206	81,5	369	400	215	130
BM 26.203	250	860	330	303	256	102,7	461	500	256	225
BM 26.204	300	900	400	353	306	97,7	511	500	291	285

Chute magnet systems, sanitary model with DIN 2576 ND10 flanges*

Art.no.	NW	B	C	D	E	F	G	H	weight (kg)
BM 26.220	100	420	220	183	108	29,5	167	294	31
BM 26.221	150	510	285	233	158	51,5	261	372	64
BM 26.222	200	610	340	283	208	81,5	371	450	125
BM 26.223	250	750	395	333	258	102,7	463,4	556	220
BM 26.224	300	760	445	383	308	102,7	513,4	546	277

All dimensions in mm

*see table page 37

BM Cascade magnet systems

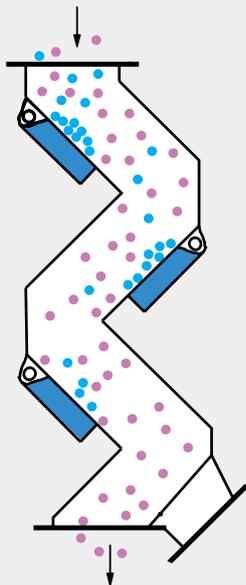


Automatic version of a cascade magnet system

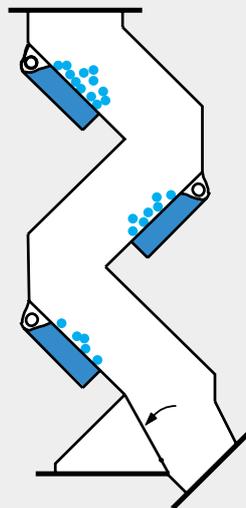
Cascade magnet systems are used in situations where ferrous particles have to be removed thoroughly from large quantities of raw materials. Cascade systems are available in manual and automatic models and are strongly built with a 4 mm thick stainless steel or steel housing. Bakker Magnetics cascade systems have a wide range of uses and are easy to incorporate in existing systems. A valve box is built in to the cascade systems to remove the ferrous particles that have been collected. Once the valve box has been opened, the magnets can be turned away and the ferrous particles will then drop out of the system via the side exit. Both manual and pneumatic versions are available in all models. With the pneumatic versions, a push of a button is sufficient to remove all the ferrous particles collected in the valve box chamber. Optionally, this type can be supplied with an electrically operated valve. All the components of the pneumatic system conform to the ISO and CETOP standards. As an option, the automatic versions can be fitted with a pressure tank which enables the system to stay in service when the supply of air pressure is lost. If required, all models can be fitted with inspection windows and/or manganese steel wear plates.

Cascade magnet systems are equipped with FDA magnets as standard. If required, they can also be supplied with FDL or FDL/C systems (see pages 7 to 9). In these cases, the article numbers have respectively "/06" or "/07" added to them.

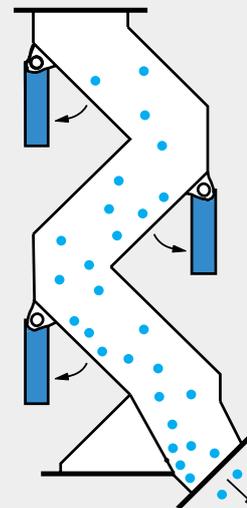
The material flow passes the magnet system



To remove the ferrous contamination, the material flow is stopped and the flap valve turned

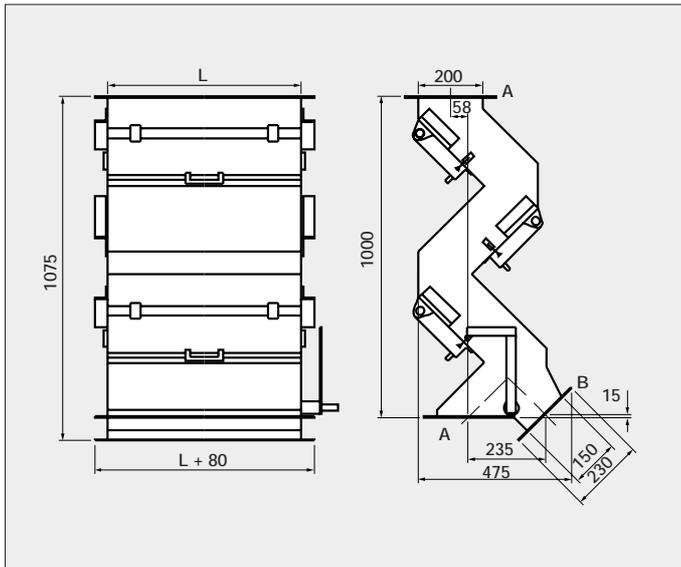


By rotating the magnets, the magnetic field is removed from the ferrous particles collected so they fall through the side opening to the outside.

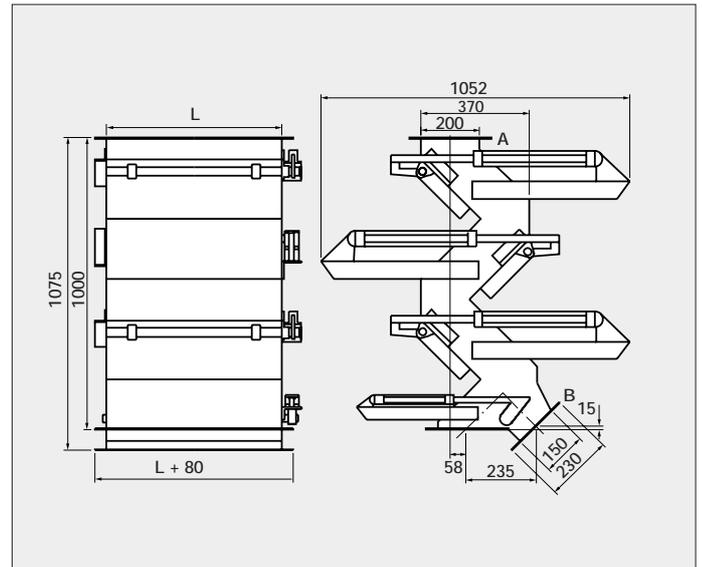


Operating principle of the Bakker Magnetics cascade magnet system.

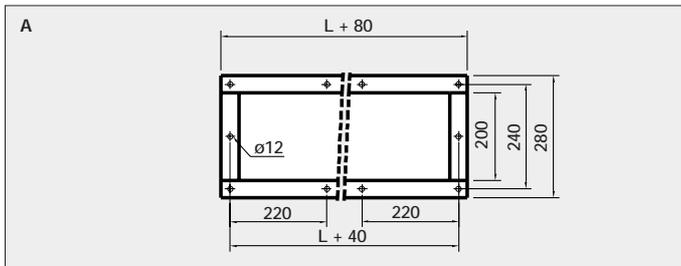
BM Cascade magnet systems



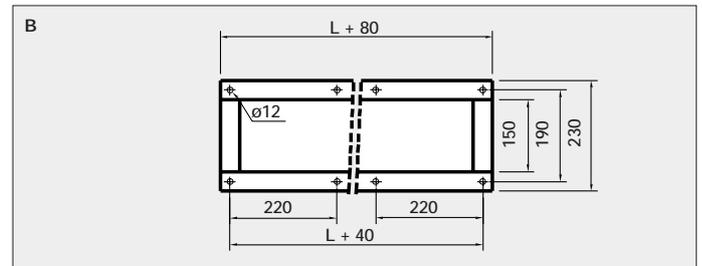
BM 26.070...



BM 26.080...



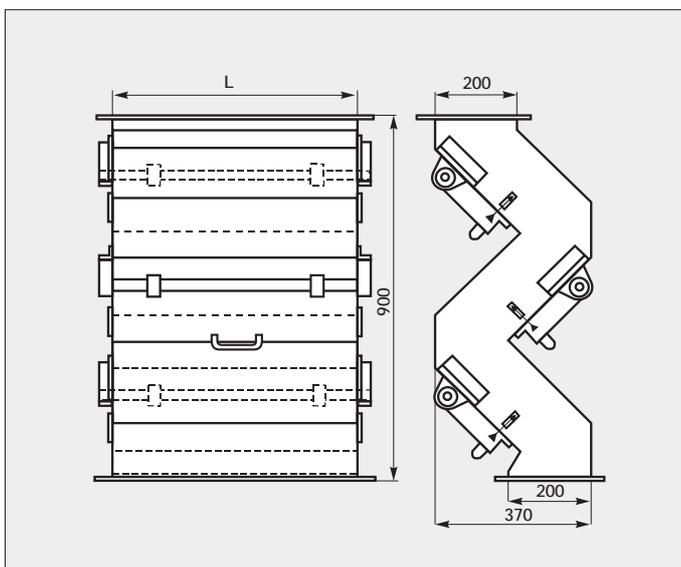
Flange dimensions in- and outlet



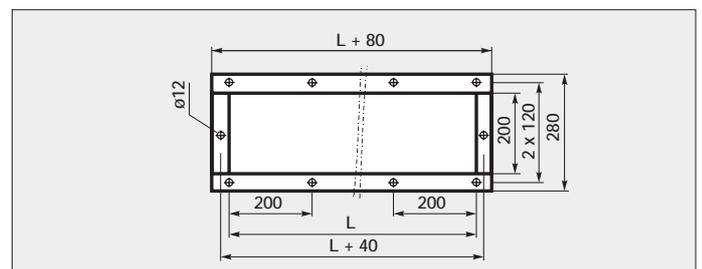
Flange dimensions valve box

Manual version	L	capacity (t/u)			weight (kg)
		grain	powder	scrap	
BM 26.070	200	7-15	5-10	3-10	125
BM 26.071	400	15-40	10-30	7-20	198
BM 26.072	600	45-70	35-50	25-40	275
BM 26.073	800	90-100	70-80	50-60	353
BM 26.074	1000	140	100	80	431
BM 26.075	1200	175	125	100	509

automatic version	L	capacity (t/u)			weight (kg)
		grain	powder	scrap	
BM 26.080	200	7-15	5-10	3-10	140
BM 26.081	400	15-40	10-30	7-20	213
BM 26.082	600	45-70	35-50	25-40	290
BM 26.083	800	90-100	70-80	50-60	368
BM 26.084	1000	140	100	80	446
BM 26.085	1200	175	125	100	524



BM 26.048...



Manually-operated cascade magnet system without valve box

art.no.	L mm	capacity (t/u)			weight (kg)
		grain	powder	scrap	
BM 26.048	200	7-15	5-10	3-10	112
BM 26.049	400	15-40	10-30	7-20	185
BM 26.050	600	45-70	35-50	25-40	262
BM 26.051	800	90-100	70-80	50-60	340
BM 26.052	1000	140	100	80	418
BM 26.053	1200	175	125	100	496

All dimensions in mm

for ferrous separation from liquids

These magnet filters are used to filter ferrous particles from liquids and they are frequently used in hydraulic circuits and cooling systems. The magnet system is constructed from ceramic magnets and the unit is built into a stainless steel (AISI 304) casing. For cleaning, the magnet system is simple to remove by undoing several quick-release fasteners. A special double-walled version is available for use in heated pipeline systems (for example, separating ferrous particles from molten chocolate and cheese). Bakker Magnetics magnet filters are available in a number of versions for special applications. For situations where extremely stringent requirements for ferrous separation have to be met and/or tiny ferrous particles (m region) have to be extracted, a system can be fitted with Neodymium magnets (add "/01" to the article number). A special version is available for use in systems with high pressures. Sanitary models are also available for applications in, for example, the food industry. For processing large quantities of raw materials, heavy-duty versions can be supplied. These versions have a processing capacity from 1000 to 8500 l/min.



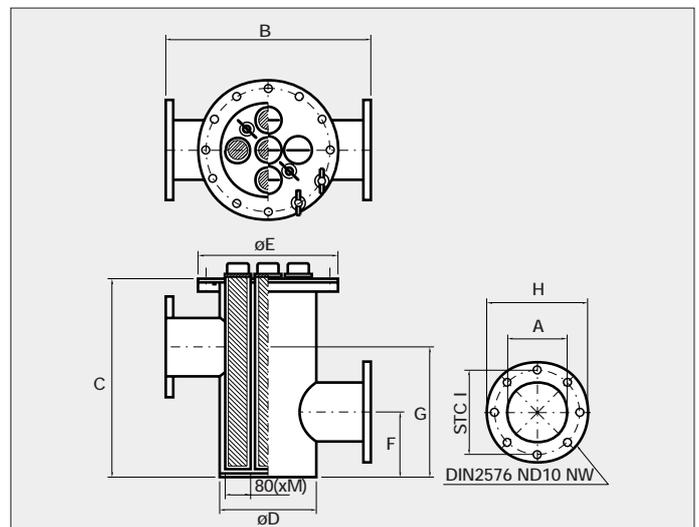
Bakker Magnetics permanent magnet filter



Bakker Magnetics magnetic filter in sanitary version

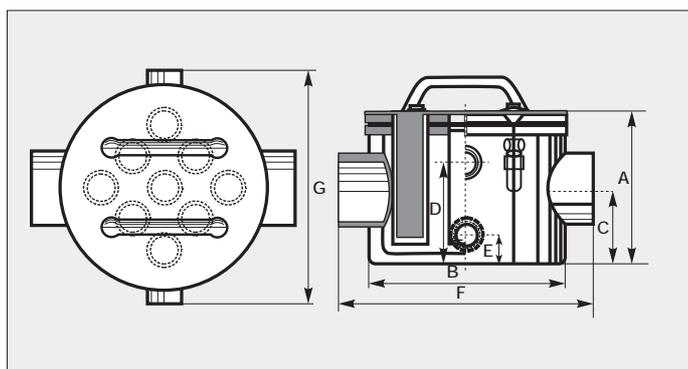


Bakker Magnetics heavy-duty magnet filter

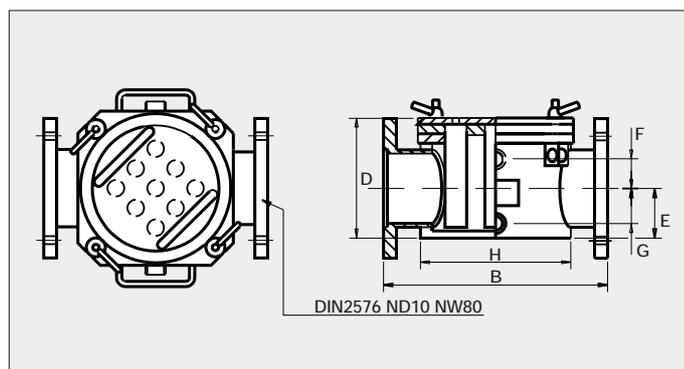


BM 20.400...

BM Permanent magnet filters



BM 20.100...



BM 20.250...

Equipped with ceramic magnets as standard. For versions with Neodymium magnet systems, add "/01" to the article number.

Magnet filters in standard versions

Art.no.	press. (Bar)	cap. (l/min)	number bars	A	B	C	D	E	F	G	weight (kg)
BM 20.100**	3	250	9	160	206	75	110	30	292	240	23
BM 20.101**	3	325	14	195	256	80	145	30	342	290	31
BM 20.102**	3	400	19	190	306	80	140	30	392	340	44
BM 20.200	3	300	9	160	206	75	-	-	292	-	21
BM 20.201	3	375	14	195	256	80	-	-	342	-	30
BM 20.202	3	475	19	190	306	80	-	-	392	-	41
BM 20.300	8	300	9	200	206	115	-	-	292	-	22
BM 20.301	8	375	14	235	256	120	-	-	342	-	31
BM 20.302	8	475	19	230	306	120	-	-	392	-	42

Magnet filters in sanitary model with Din 2576 ND10 flanges*

Art.no.	press. (Bar)	cap. (l/min)	aantal magnet bars	B	D	E	F	G	H	I	weight (kg)
BM 20.250**	3	300	9	366	190	90	38	63	256	352	39
BM 20.251**	3	375	14	416	225	95	38	68	306	402	54
BM 20.252**	3	475	19	466	220	95	38	68	324	422	60
BM 20.253	3	300	9	316	175	75	-	-	206	302	29
BM 20.254	3	375	14	366	210	80	-	-	256	352	31
BM 20.255	3	475	19	416	205	80	-	-	306	402	52
BM 20.256**	10	300	9	366	230	130	38	63	256	352	41
BM 20.257**	10	375	14	416	265	135	38	68	306	402	57
BM 20.258**	10	475	19	466	260	135	38	68	324	422	63
BM 20.259	10	300	9	316	215	115	-	-	206	302	30
BM 20.260	10	375	14	366	250	125	-	-	256	352	42
BM 20.261	10	475	19	416	245	125	-	-	306	402	54

** = double walled. Medium connection: 2,5 ". Water connection: 3/4 " G

Non-standard connections on request

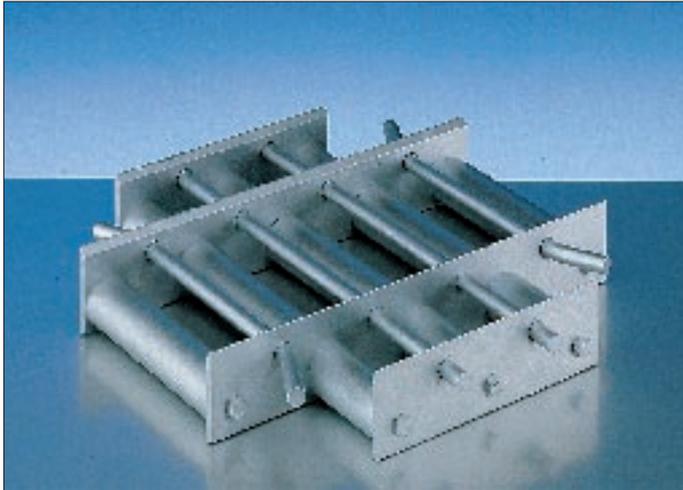
Heavy-duty magnet filters in version with Din 2576 ND10 flanges*

Art.no.	A	B	C	D	E	F	G	Din2576 NW	capacity l/min	M	max. press. (Bar)	weight (kg)
BM 20.400	162	580	563	273	395	185	370	150	1000-2600	5	5	113
BM 20.401	213	660	748	324	445	250	500	200	1900-4900	5	5	155
BM 20.402	261	760	953	407	565	325	625	250	2900-7300	5	9	289
BM 20.403	318	860	953	457	615	325	625	300	3400-8500	5	9	308

All dimensions in mm

*see table page 37

BM Permanent magnet grids



Bakker Magnetics ceramic magnet grid - circular version



Bakker Magnetics ceramic magnet grid - rectangular version

Permanent magnet grids are placed in pipeline systems, hoppers, chutes, etc., to separate ferrous particles from materials flowing past the grid.

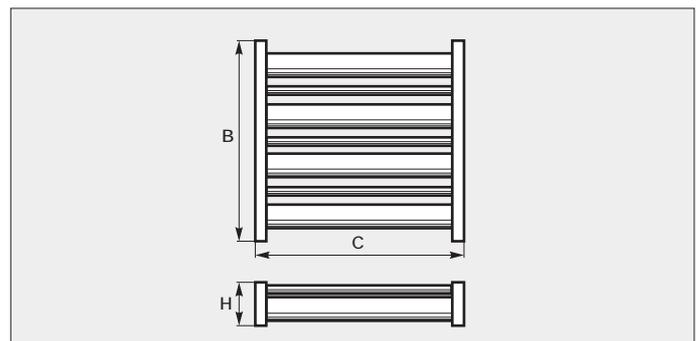
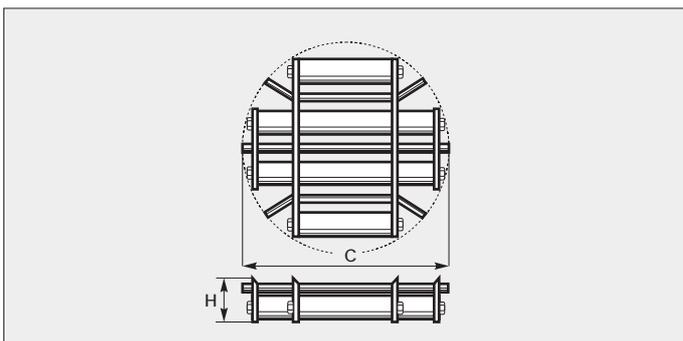
To ensure durability against corrosion and wear and to supply good mechanical strength, all parts of the casing that come in contact with the material to be decontaminated are made from stainless steel (AISI 304). By carefully calculating the dimensions of the entire system, the resistance to the material flowing through is small and the chance of bridges forming is minimal. Bakker Magnetics permanent magnet grids with ceramic magnets are suitable for temperatures up to 150°C. For applications where a higher magnetic force is required, magnet grids fitted with strong Neodymium magnets can be supplied. These can be used to temperatures up to 90°C. There is also a version available with a demountable magnet system for simple and thorough cleaning.

The table below gives an overview of the standard range. If required, non-standard sizes and/or specifications can be supplied on order. Equipped with ceramic magnets as standard. For versions fitted with Neodymium magnets, add "/01" to the article number.

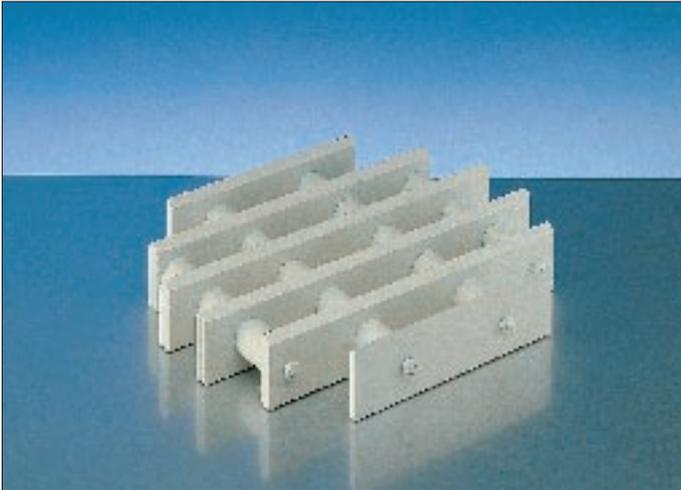
Art.no.	C	B	H	open area (cm ²)	weight (kg)
BM 25.100	ø 100		40	39	0,5
BM 25.101	ø 150		40	92	1,5
BM 25.102	ø 200		40	126	3,0
BM 25.103	ø 250		40	210	4,0
BM 25.104	ø 300		40	236	5,0
BM 25.105	ø 350		40	409	7,0
BM 25.106	ø 400		40	512	8,0
BM 25.107	ø 450		40	550	10,0
BM 25.108	ø 500		40	780	13,0
BM 25.109	ø 550		40	948	16,0
BM 25.110	ø 600		40	1140	20,0
BM 25.150	100	100	40	39	1,0
BM 25.151	150	150	40	88	2,0
BM 25.152	200	200	40	156	3,0
BM 25.153	250	250	40	255	5,0
BM 25.154	300	300	40	348	6,0
BM 25.155	400	400	40	617	9,0
BM 25.156	500	500	40	965	15,0
BM 25.157	600	600	40	1382	21,0

All dimensions in mm

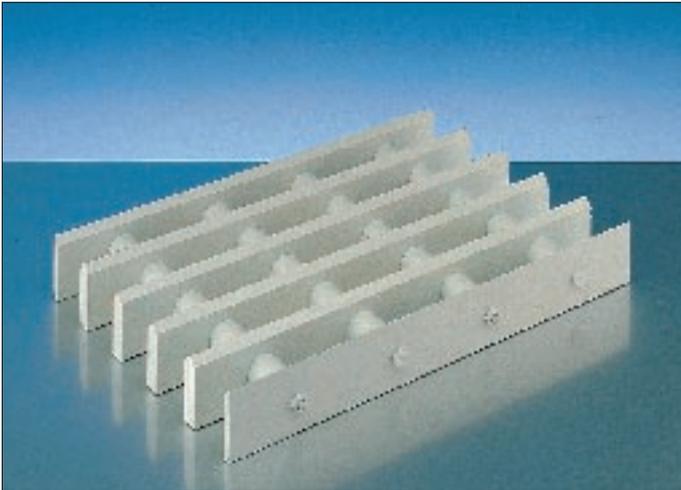
Other dimensions on request



BM Permanent magnet grids



Bakker Magnetics Alnico magnet grid - circular version



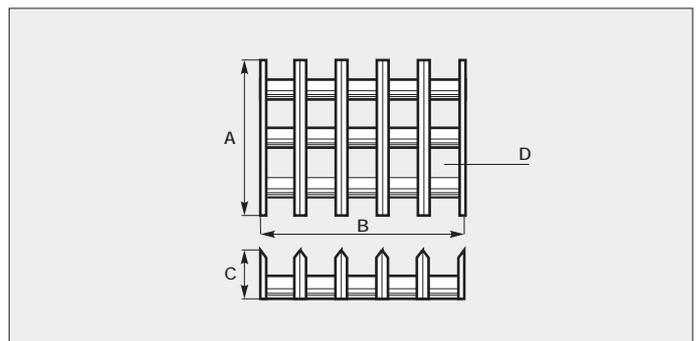
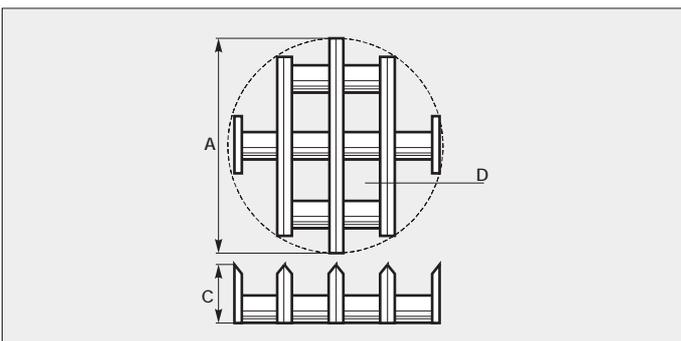
Bakker Magnetics Alnico magnet grid - rectangular version

Permanent AlNiCo magnet grids can be supplied in round and rectangular versions. Because of the carefully calculated relationships between the measurements and the beneficial design of the very powerful magnet system, the resistance to the flow of the materials is very low. AlNiCo permanent magnet grids are able to withstand high temperatures - up to 350°C - and have great durability. For applications where corrosion resistance is demanded, for example in the food industry, these magnet grids can be supplied with an epoxy coating.

Art.no.	A	B	C	D	open area (cm ²)	weight (kg)
BM 25.001	ø150		40	50 x 22	101	1,6
BM 25.002	ø200		40	40 x 30	144	2,8
BM 25.003	ø250		40	40 x 30	255	4,4
BM 25.004	ø300		40	35 x 30	315	6,8
BM 25.005	ø350		40	35 x 30	462	9,7
BM 25.006	ø400		40	30 x 30	540	13,0
BM 25.007	ø500		40	35 x 30	1518	20,6
BM 25.008	ø600		40	40 x 30	1344	28,8
BM 25.050	150	100	40	40 x 30	72	2,1
BM 25.051	200	100	40	40 x 30	120	2,3
BM 25.052	200	150	40	50 x 30	195	3,1
BM 25.053	250	200	40	40 x 30	252	5,7
BM 25.054	300	200	40	50 x 30	330	6,2
BM 25.055	250	300	40	50 x 30	396	8,4
BM 25.056	400	300	40	40 x 30	540	15,6
BM 25.057	400	350	40	50 x 30	708	14,7
BM 25.058	500	400	50	55 x 38	988	26,0
BM 25.059	600	300	40	40 x 30	910	19,6
BM 25.060	600	400	40	50 x 30	1287	25,4
BM 25.061	600	500	40	50 x 30	1664	31,6
BM 25.062	700	500	40	50 x 30	1856	38,6
BM 25.063	800	500	40	50 x 30	2184	41,7
BM 25.064	150	150	40	60 x 30	99	3,3
BM 25.065	200	200	40	50 x 30	210	4,2
BM 25.066	300	300	40	38 x 22	420	10,6
BM 25.067	400	400	40	45 x 30	770	16,4
BM 25.068	500	500	50	55 x 38	1235	33,7

All dimensions in mm

Other dimensions on request



BM Permanent magnet grids MAGBOX



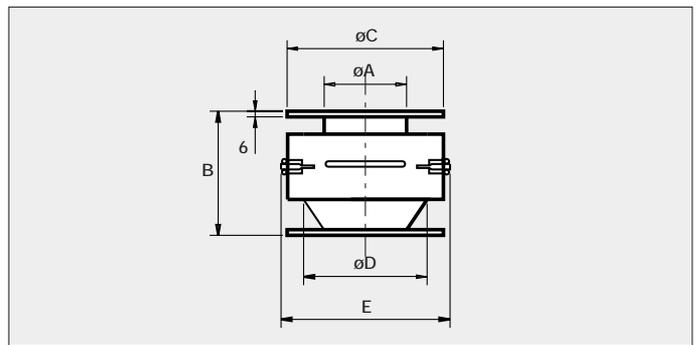
Bakker Magnetics Magbox ferrous separation system in the feed industry



BM 25.200...

MAGBOX: a complete ferrous separation unit for installation in pipeline systems

This type of ferrous separation unit can be easily installed in existing pipeline systems. In the standard versions, each unit has two permanent magnet grids mounted one above the other. For special applications, versions with multiple grids are available. The diameter of the filter bars in the grids is 23 mm. The grids are easily removable for cleaning by opening a flap on the front. The Magbox comes complete with flanges. Non-standard versions are available on special order. As standard, the ferrous separation units are equipped with ceramic magnet grids in a robust steel casing. If required, versions in stainless steel (AISI 304) casings can be supplied (add "/10" to the article number). Versions using Neodymium magnets for separating particles in the μ range are always supplied in a stainless steel casing. The range also includes sanitary models. These have a semi-automatic cleaning system - the system is cleaned with only two hand movements.

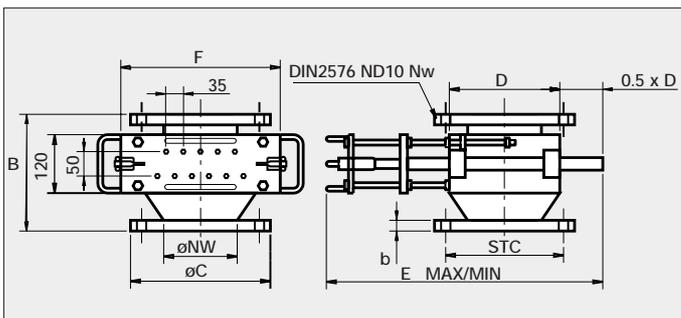


Art.no.	A	B	C	D	E	number of bars	weight (kg)
BM 25.200	50	184	130	128	208	5	19
BM 25.201	100	194	180	160	240	7	28
BM 25.202	150	204	230	225	305	11	37
BM 25.203	200	214	280	295	375	15	46
BM 25.204	250	220	330	362	442	19	55
BM 25.205	300	230	400	410	490	21	71

All dimensions in mm

Permanent magnet grids in sanitary model with DIN 2576 flanges*

Supplied as standard with ceramic magnets. Add "/01" to the article number for versions with Neodymium magnet systems.

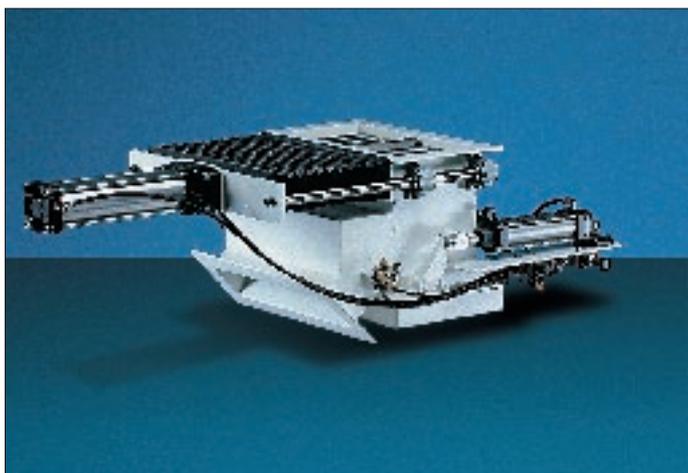


Art.no.	NW	B	C	D	E		F	number of bars	wt (kg)
					max	min			
BM 25.220	50	270	165	155	620	302,5	225	7	25
BM 25.221	100	270	220	190	740	355,0	290	9	34
BM 25.222	150	270	285	225	865	407,5	325	11	43
BM 25.223	200	270	340	260	985	460,0	360	13	55
BM 25.224	250	270	395	295	1110	512,5	395	15	66
BM 25.225	300	300	445	365	1355	617,5	465	19	82

All dimensions in mm

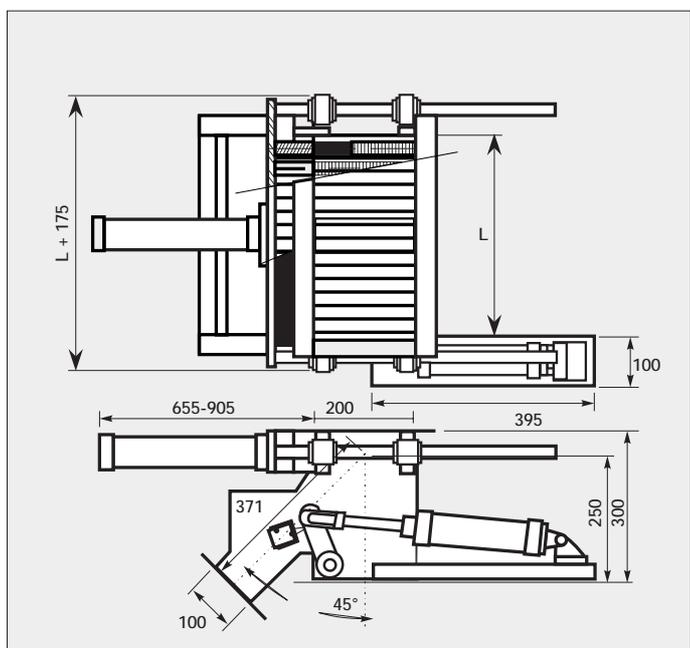
*see table page 37

BM Automatically cleaned permanent magnet grids



BM 25.301...

These types of ferrous separation system can be built into practically every (existing) pipeline system because of their compact dimensions. By simply pressing a button, the ferrous particles collected from the material flow are removed from the stainless steel attracting elements of the grid. The fine-mesh grid together with the powerful magnetic field ensure a thorough separation of ferrous particles. The system is very maintenance friendly. In addition, the components most susceptible to wear can be replaced quite simply. It can be either electrically or pneumatically operated - very flexible. This makes these types ideally suited for use in automated systems. These automatic permanent magnet grids can be supplied with either ceramic or Neodymium magnet systems.

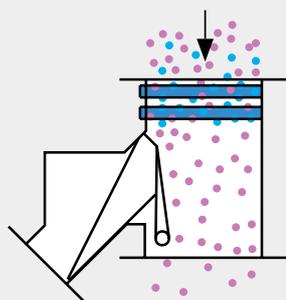


Art.nr. Ceramic version	Art.nr. Neodymium version	L	*)	weight (kg)
BM 25.301	BM 25.301/01	200	22	50
BM 25.302	BM 25.302/01	400	21	76
BM 25.303	BM 25.303/01	600	23	97
BM 25.304	BM 25.304/01	800	20	122

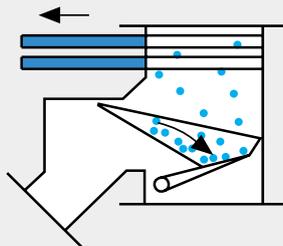
*) space between the bars

All dimensions in mm

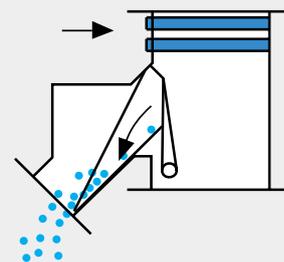
The material flows passes the magnet system.



To remove the contamination, the material flow is stopped and the magnets withdrawn from the tubes.



The magnets are re-inserted in the tubes and then the tray discharges the contamination externally. The system is ready for production.

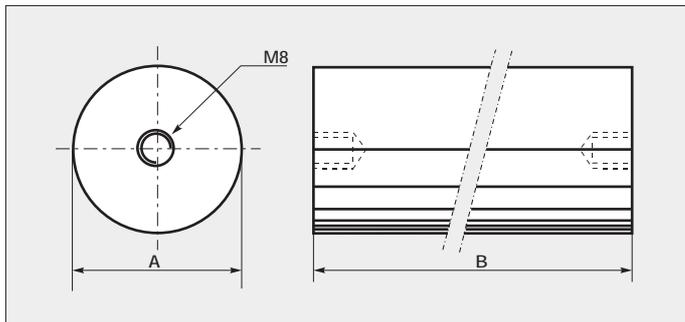


Operating principles of the Bakker Magnetics self-cleaning magnet grid.

BM Permanent magnetic filter bars



Stainless steel version with ceramic magnets



Permanent magnetic filter bars can be installed at any point in solid or liquid material flows. They can be used up to temperatures of 150°C. The filter bars are manufactured from powerful ceramic magnets in a stainless steel (AISI 304) casing. This construction has a high degree of corrosion resistance and is quick and easy to clean. The standard diameters of the filter bars is 25.4 or 40 mm and the ends have M8 threaded holes so they can be easily installed in almost any position. For applications involving higher temperatures (up to 350°C), versions fitted with AlNiCo magnets can be supplied. In situations where, for example, very fine ferrous particles in the μ region or ferrous particles have to be separated from viscous materials, the Bakker Magnetics permanent magnetic filter bars can also be supplied in versions with Neodymium magnetic material.

Stainless steel version with ceramic magnets - large diameter

Art.no.	A	B	weight (kg)
BM 19.500/10	40	50	0,5
BM 19.501/10	40	100	1,0
BM 19.502/10	40	150	1,5
BM 19.503/10	40	200	2,0
BM 19.504/10	40	250	2,5
BM 19.505/10	40	300	3,0
BM 19.506/10	40	350	3,5
BM 19.507/10	40	400	4,0
BM 19.508/10	40	450	4,5
BM 19.509/10	40	500	5,0

Stainless steel version - small diameter

Art.no. ceramic version	Art.no. Neodymium version	A	B	weight (kg)
BM 19.450	BM 19.450/01	25,4	50	0,2
BM 19.451	BM 19.451/01	25,4	100	0,4
BM 19.452	BM 19.452/01	25,4	150	0,6
BM 19.453	BM 19.453/01	25,4	200	0,8
BM 19.454	BM 19.454/01	25,4	250	1,0
BM 19.455	BM 19.455/01	25,4	300	1,2
BM 19.456	BM 19.456/01	25,4	350	1,4
BM 19.457	BM 19.457/01	25,4	400	1,6
BM 19.458	BM 19.458/01	25,4	450	1,8
BM 19.459	BM 19.459/01	25,4	500	2,0

All dimensions in mm

Hand magnet

Hand magnet for taking samples of the materials to determine, for example, the presence and degree of ferrous contamination. The length of the magnet is 100 mm. The diameter 23 mm.

Art.no. BM 19.950/01

for the waste disposal and recycling industries



The waste disposal and recycling industries use different metal separation systems to those already described in this brochure. This branch of industry tries to isolate raw materials from other waste in an environmentally-friendly way so that metals can be economically recycled. Conventional systems such as overbelt systems, separation drums and head rollers have been improved over the past few years and more functionality has been added. Also, more types can be supplied with Neodymium magnet systems. Eddy Current non-ferrous metal separators occupy a special place. Bakker Magnetics has recently introduced a second generation of Eddy Current non-ferrous metal separators developed together with the Technical University of Delft. The efficiency is greatly improved with the introduction of a completely new 18-pole magnet cylinder. For many applications, the separating power can reach almost 100%. Recent tests in the glass recycling industry showed, for example, an efficiency of 99.8%.

Bakker Magnetics overband systems in the waste disposal and recycling industries



BM Overband magnet systems



Bakker Magnetics permanent overbelt magnet system.

The most important application for overband magnet systems is ferrous metal separation from materials on conveyor belts. To do this, they are installed over the conveyor belt. The magnetic system lifts the ferrous particles from the material flow passing underneath and then drops them into a collection bin when they leave the magnetic field.

The working surface of the magnets is protected by a stainless steel plate which absorbs any wear. This type of ferrous separation system is often used in industry to prevent ferrous particles damaging production machines such as shredders. A growing application area is the recycling industry often in combination with Eddy Current non-ferrous metal separators. Bakker Magnetics overbelt magnet systems are supplied in two main types, one using permanent magnets and the other electromagnets. Last mentioned for effective field depth > 500 mm.

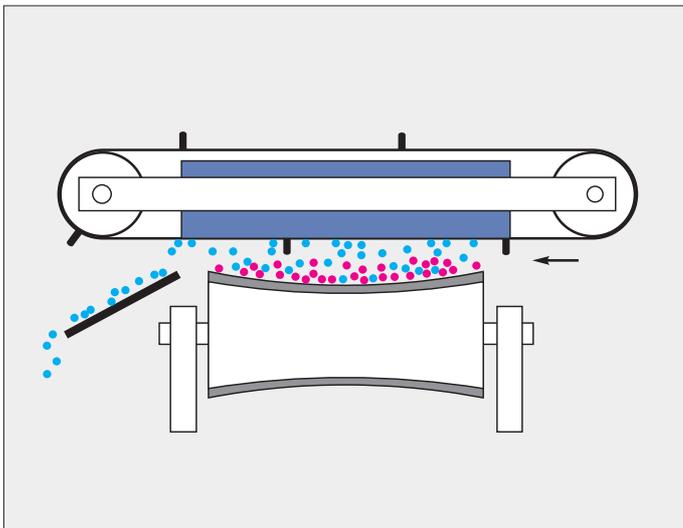
Permanent magnet systems

This type of ferrous separation system from Bakker Magnetics is equipped with a powerful permanent magnet. The standard drive for the overbelt magnet system (up to and including the 320 series) is a drum motor. On the 400 and 500 series, the standard drive is by means of a shaft-mounted reduction motor. If required, the belt on the 220 series can also be equipped with the same sort of motor (add "/21" to the article number). The overbelt systems are equipped with a belt tensioner and because of the concave shape of the drums, the belt is self centring. The belt is made from synthetic rubber with vulcanised idlers. The electrical connections conform to standard IP 54 or, if required, IP 65 and the standard power supply required is 3 x 380 V 50 Hz. Systems are available for other voltages if necessary. Some types can be supplied in a 'stretch' version. In these, a transport pole is added as a continuation of the main pole. This transport pole produces a change in the magnetic field which causes the ferrous particles on the belt to move so that any non-ferrous particles which had been hold by the iron particles can drop back into the material flow. This means there are fewer impurities in the ferrous collection. The 'stretch' versions can only be installed with the belt running in the same direction as the conveyor belt. In the 400 and 500 series, the rubber conveyor belt has a wear-resistant layer (Correx blue 45° shore) between the idlers.

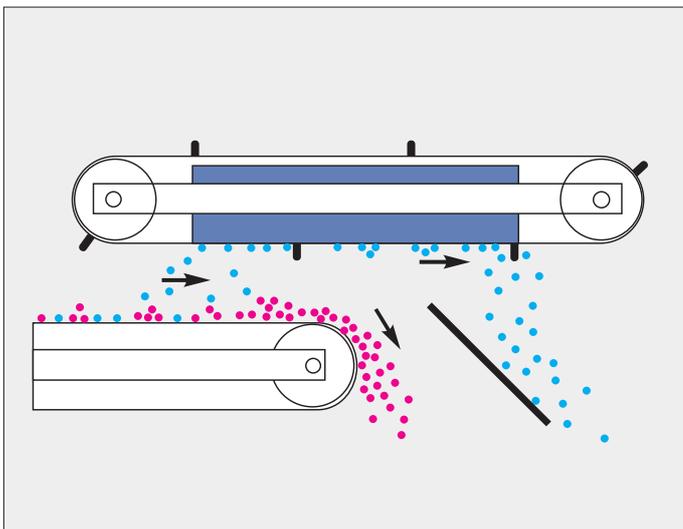
Effective depth of magnetic field - overband magnets

Art.no.	bar ø 5x25	bar ø 5x75	nut M16
28.001 t/m 28.003	165	225	130
28.101 t/m 28.111	255	370	180
28.130 t/m 28.140	260	380	195
28.010 t/m 28.014	295	430	225
28.020 t/m 28.024	315	460	240
28.030 t/m 28.035	335	480	250
28.040 t/m 28.047	360	500	275

All dimensions in mm

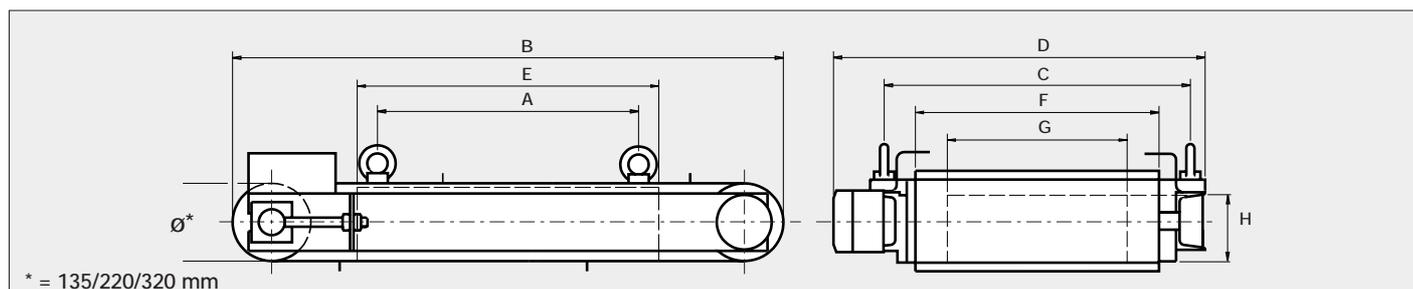


Overbelt magnet system mounted transversely over the conveyor belt.



Overbelt magnet system mounted longitudinally over the end roller of the conveyor belt.

BM Overband magnet systems



* = 135/220/320 mm

135 series

Art. no.	A	B	C	D	E	F	G	H	power motor (kW)	weight (kg)
BM 28.001	450	955	530	640	520	420	310	130	0,55	153
BM 28.002	650	1155	530	640	720	420	310	130	0,55	197
BM 28.003	850	1355	530	640	920	420	310	130	0,55	242

220 series

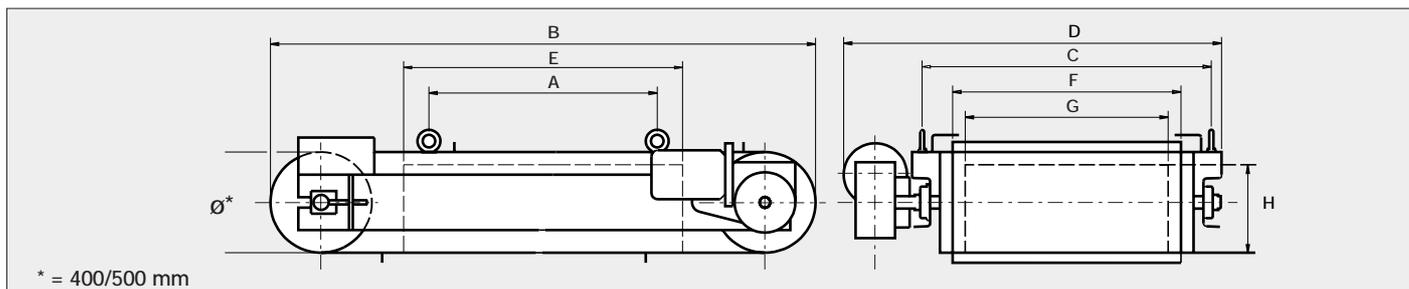
Art.no.	A	B	C	D	E	F	G	H	power motor (kW)	weight (kg)
BM 28.101	240	1050	850	1015	430	650	505	180	1,1	335
BM 28.102	300	1150	850	1015	530	650	505	180	1,1	375
BM 28.103	360	1250	850	1015	635	650	505	180	1,1	420
BM 28.104	420	1355	850	1015	735	650	505	180	1,1	470
BM 28.105	475	1455	850	1015	835	650	505	180	1,1	515
BM 28.106	535	1555	850	1015	935	650	505	180	1,1	560
BM 28.107	595	1655	850	1015	1040	650	505	180	1,1	600
BM 28.108	655	1755	850	1015	1140	650	505	180	1,1	650
BM 28.109	715	1860	850	1015	1250	650	505	180	1,1	695
BM 28.110	775	1960	850	1015	1350	650	505	180	1,1	740
BM 28.111	830	2060	850	1015	1450	650	505	180	1,1	785
BM 28.130	240	1050	1050	1225	430	900	810	180	1,5	470
BM 28.131	300	1150	1050	1225	530	900	810	180	1,5	545
BM 28.132	360	1250	1050	1225	635	900	810	180	1,5	620
BM 28.133	420	1355	1050	1225	735	900	810	180	1,5	695
BM 28.134	475	1455	1050	1225	835	900	810	180	1,5	765
BM 28.135	535	1555	1050	1225	935	900	810	180	1,5	840
BM 28.136	595	1655	1050	1225	1040	900	810	180	1,5	915
BM 28.137	655	1755	1050	1225	1140	900	810	180	1,5	990
BM 28.138	715	1860	1050	1225	1250	900	810	180	1,5	1060
BM 28.139	775	1960	1050	1225	1350	900	810	180	1,5	1140
BM 28.140	830	2060	1050	1225	1450	900	810	180	1,5	1210

320 series

Art. no.	A	B	C	D	E	F	G	H	power motor (kW)	weight (kg)
BM 28.010	600	1705	975	1125	835	700	610	247	2,2	734
BM 28.011	800	1910	975	1125	1040	700	610	247	2,2	891
BM 28.012	1000	2120	975	1125	1250	700	610	247	2,2	1048
BM 28.013	1200	2320	975	1125	1450	700	610	247	2,2	1250
BM 28.014	1400	2520	975	1125	1650	700	610	247	2,2	1363
BM 28.020	600	1705	1175	1325	835	900	810	247	2,2	930
BM 28.021	800	1910	1175	1325	1040	900	810	247	2,2	1136
BM 28.022	1000	2120	1175	1325	1250	900	810	247	2,2	1342
BM 28.023	1200	2320	1175	1325	1450	900	810	247	2,2	1548
BM 28.024	1400	2520	1175	1325	1650	900	810	247	2,2	1754

All dimensions in mm

BM Overband magnet systems



400 series

Art. no.	A	B	C	D	E	F	G	H	power motor (kW)	weight (kg)
BM 28.030	600	1885	1220	1490	835	900	810	350	2,2	1336
BM 28.031	800	2090	1220	1490	1040	900	810	350	2,2	1622
BM 28.032	1000	2300	1220	1490	1250	900	810	350	2,2	1789
BM 28.033	1200	2500	1220	1490	1450	900	810	350	2,2	2194
BM 28.034	1400	2700	1220	1490	1650	900	810	350	2,2	2481
BM 28.035	1600	2900	1220	1490	1850	900	810	350	2,2	2767

500 series

Art. no.	A	B	C	D	E	F	G	H	power motor (kW)	weight (kg)
BM 28.040	600	2085	1350	1640	835	1050	900	410	2,2	1758
BM 28.041	800	2290	1350	1640	1040	1050	900	410	2,2	2135
BM 28.042	1000	2500	1350	1640	1250	1050	900	410	2,2	2512
BM 28.043	1200	2700	1350	1640	1450	1050	900	410	2,2	2819
BM 28.044	1400	2900	1350	1640	1650	1050	900	410	3,0	3266
BM 28.045	1600	3100	1350	1640	1850	1050	900	410	3,0	3642
BM 28.046	1800	3300	1350	1640	2050	1050	900	410	3,0	4019
BM 28.047	2000	3500	1350	1640	2250	1050	900	410	3,0	4369

All dimensions in mm

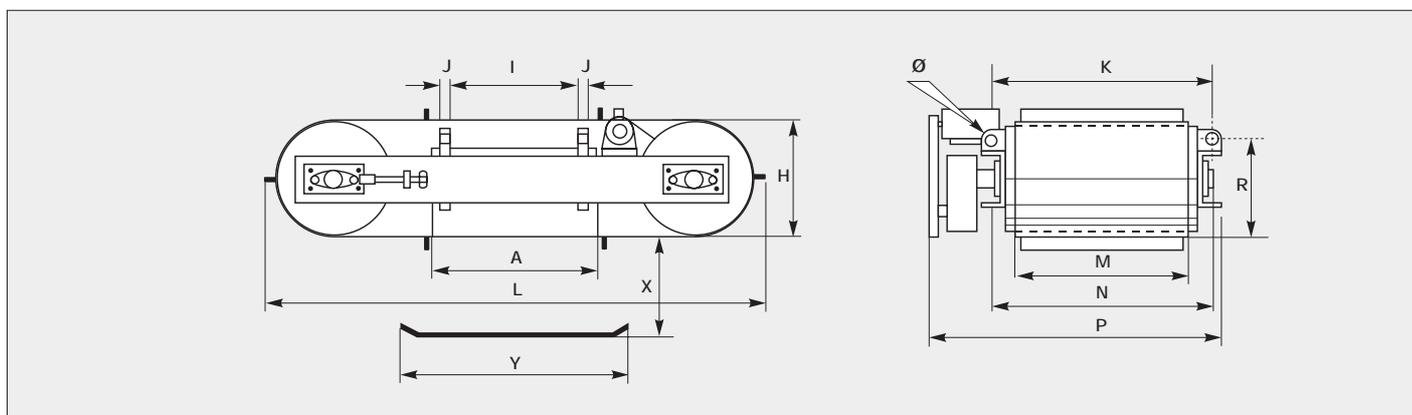
BM Overband magnet systems

Electromagnetic overband systems

Alongside the permanent magnet types, the Bakker Magnetics range also includes electromagnetic overband systems. The coils of the powerful inbuilt electromagnet are wound with aluminium tape which gives them excellent thermal properties. They meet insulation class H. Oil cooled and/or explosion-safe models can be supplied on special order.

The standard of protection for the air-cooled versions is IP 54, for the oil-cooled versions IP 65, and for the

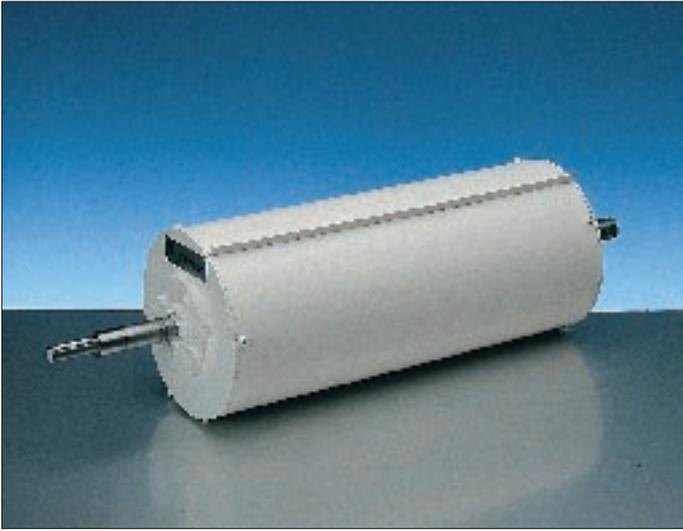
explosion-safe version IP 69. The belt used in the systems is manufactured from synthetic rubber with vulcanised idlers. Because of the convex drums, the belt is self-centring. The drive is by a shaft-mounted reduction motor or a separate motor with a V-belt drive. The electrical power supply is converted from the mains (3 x 380 V 50 Hz) by a transformer/rectifier and conforms to the IP 55 standard.



Art.no.	Power magnet (kW)	belt width Y	max. work depth X	power motor (kW)	A	H	I	J	K	L	M	N	P	R	Ø	weight (kg)
BM 28.150	1,95	500	200	1,5	400	450	320	30	725	1950	500	750	1000	400	31	820
BM 28.151	2,55	500	280	1,5	400	450	320	30	875	2050	650	950	1200	400	31	1040
BM 28.152	3,00	500	350	1,5	400	450	320	30	1025	2150	800	1050	1300	400	31	1180
BM 28.153	2,25	650	200	1,5	500	450	420	30	725	2050	500	750	1000	400	31	970
BM 28.154	2,85	650	280	1,5	500	450	420	30	875	2150	650	950	1200	400	31	1160
BM 28.155	3,50	650	350	1,5	500	450	420	30	1025	2250	800	1050	1300	400	31	1350
BM 28.156	4,44	650	420	2,2	500	450	420	30	1225	2410	1000	1310	1500	400	31	1680
BM 28.157	2,60	800	200	1,5	650	450	570	30	725	2200	500	750	1000	400	31	1200
BM 28.158	3,20	800	280	1,5	650	450	570	30	875	2300	650	950	1200	400	31	1410
BM 28.159	3,90	800	350	1,5	650	450	570	30	1025	2400	800	1050	1300	400	31	1650
BM 28.160	5,00	800	420	2,2	650	450	570	30	1225	2560	1000	1310	1500	400	31	2050
BM 28.161	7,10	800	500	3,0	650	600	550	40	1500	3000	1200	1560	1810	550	41	3060
BM 28.162	3,66	1000	280	1,5	800	450	720	30	865	2450	650	950	1200	400	31	1630
BM 28.163	4,35	1000	350	1,5	800	450	720	30	1025	2550	800	1050	1300	400	31	1940
BM 28.164	5,60	1000	420	2,2	800	450	720	30	1225	2710	1000	1310	1500	400	31	2450
BM 28.165	7,90	1000	500	3,0	800	600	700	40	1500	3150	1200	1560	1800	550	41	3620
BM 28.166	9,60	1000	600	3,0	800	600	700	40	1700	3180	1400	1830	2080	550	41	4750
BM 28.167	5,00	1200	350	2,2	1000	450	920	30	1025	2750	800	1060	1280	400	31	2340
BM 28.168	6,30	1200	420	2,2	1000	450	920	30	1225	2910	1000	1310	1500	400	31	2950
BM 28.169	8,90	1200	500	3,0	1000	600	900	40	1500	3300	1200	1560	1800	550	41	4400
BM 28.170	10,60	1200	600	3,0	1000	600	900	40	1700	3400	1400	1830	2080	550	41	5450
BM 28.171	7,05	1400	420	3,0	1200	450	1100	40	1225	3110	1000	1310	1500	400	41	3460
BM 28.172	9,80	1400	500	3,0	1200	600	1100	40	1500	3500	1200	1360	1800	550	41	5100
BM 28.173	11,60	1400	600	3,0	1200	600	1100	40	1700	3600	1400	1830	2080	550	41	5980
BM 28.174	14,30	1400	720	4,0	1200	600	1100	40	1900	3680	1600	2030	2300	550	41	6380
BM 28.175	7,78	1600	420	3,0	1400	450	1300	40	1225	3410	1000	1310	1500	400	41	3980
BM 28.176	10,80	1600	500	3,0	1400	600	1300	40	1500	3700	1200	1560	1800	550	41	5820
BM 28.177	12,70	1600	600	3,0	1400	600	1300	40	1700	3800	1400	1830	2080	550	41	6960
BM 28.178	15,50	1600	720	4,0	1400	600	1300	40	1900	3880	1600	2030	2300	560	41	7350
BM 28.179	11,56	1800	500	3,0	1600	600	1500	40	1500	3900	1200	1560	1800	550	41	6530
BM 28.180	13,80	1800	600	4,0	1600	600	1500	40	1700	4000	1400	1830	2080	550	41	7620
BM 28.181	16,70	1800	720	4,0	1600	600	1500	40	1900	4080	1600	2030	2300	550	41	8100

All dimensions in mm.

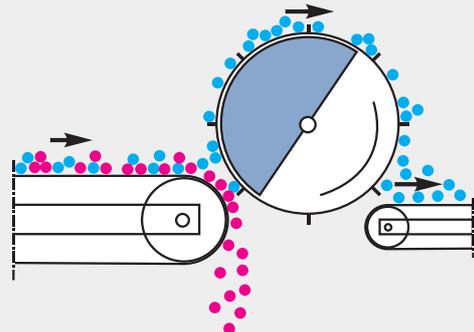
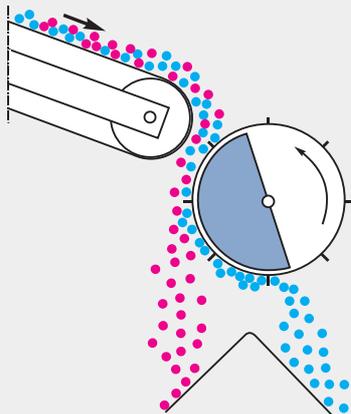
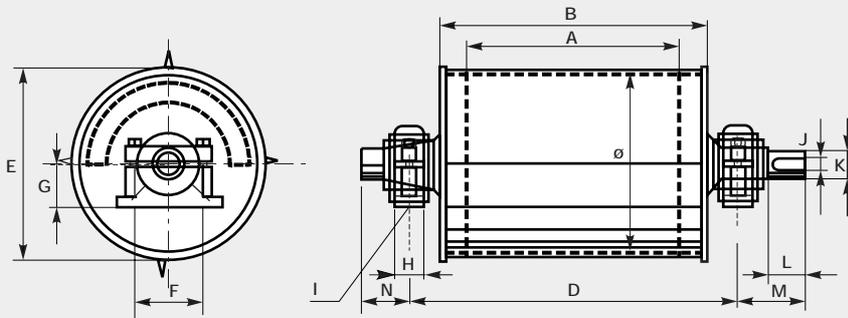
BM Drum magnets



BM 29.045...

Drum magnets, also called separation drums, contain two sectors - one magnetic and the other not. There is a drum which rotates around the outside of these and over which the material flows or is dropped. To assist the separation process, the drum is fitted with idlers. The material is dropped onto the magnetic sector of the drum, and, because of the magnetic field, the ferrous particles stick to the drum. They only fall off when the magnetic sector is left and can therefore be collected separately. The illustrations on this page will help clarify the principle. The drum is manufactured from stainless steel and has a rotating and a stationary axle. The rotating axle drives the drum, the stationary one is used to position the magnetic field. The magnetic field covers 180°. Bearing blocks are supplied.

Drum magnets are equipped with a permanent ceramic magnet system. The types with drum diameters of 215 and 315 mm can also be supplied with the extra powerful Neodymium magnet system (add "/01" to the article number). All versions are virtually maintenance free.



BM Drum magnets

Art.no.	∅	Max. capacity (m ³ /h)	recomm. revs (rpm)	motor power (kW)	A	B	D	E	F	G	H	I	J	K	L	M	N	weight (kg)
BM 29.045	215	5	40	0,25	400	500	650	215	150	50	50	12	8	28	60	135	50	85
BM 29.046	215	6	40	0,25	500	600	750	215	150	50	50	12	8	28	60	135	50	95
BM 29.047	215	8	40	0,25	650	750	900	215	150	50	50	12	8	28	60	135	50	120
BM 29.048	215	10	40	0,25	800	900	1050	215	170	60	50	14	10	32	80	135	50	135
BM 29.049	215	12	40	0,25	1000	1100	1250	215	170	60	50	14	10	32	80	135	50	165
BM 29.050	315	12	40	0,25	400	500	680	320	170	60	50	14	10	35	80	160	50	100
BM 29.051	315	15	40	0,25	500	600	780	320	170	60	50	14	10	35	80	160	50	115
BM 29.052	315	20	40	0,25	650	750	930	320	170	60	50	14	10	35	80	160	50	140
BM 29.053	315	25	40	0,25	800	900	1080	320	170	60	50	14	12	40	110	160	50	160
BM 29.054	315	30	40	0,37	1000	1100	1280	320	170	60	50	14	12	40	110	160	50	190
BM 29.055	400	20	35	0,25	400	500	700	405	210	70	60	18	14	45	110	165	70	160
BM 29.056	400	25	35	0,25	500	600	800	405	210	70	60	18	14	45	110	165	70	180
BM 29.057	400	30	35	0,25	650	750	950	405	210	70	60	18	14	45	110	165	70	210
BM 29.058	400	40	35	0,37	800	900	1100	405	230	80	60	18	16	55	110	165	70	240
BM 29.059	400	50	35	0,37	1000	1100	1300	405	230	80	60	18	16	55	110	165	70	280

All dimensions in mm

Separating drum in housing

This magnet system consists of a drum magnet in a strong housing which can be easily integrated in (existing) pipeline systems.

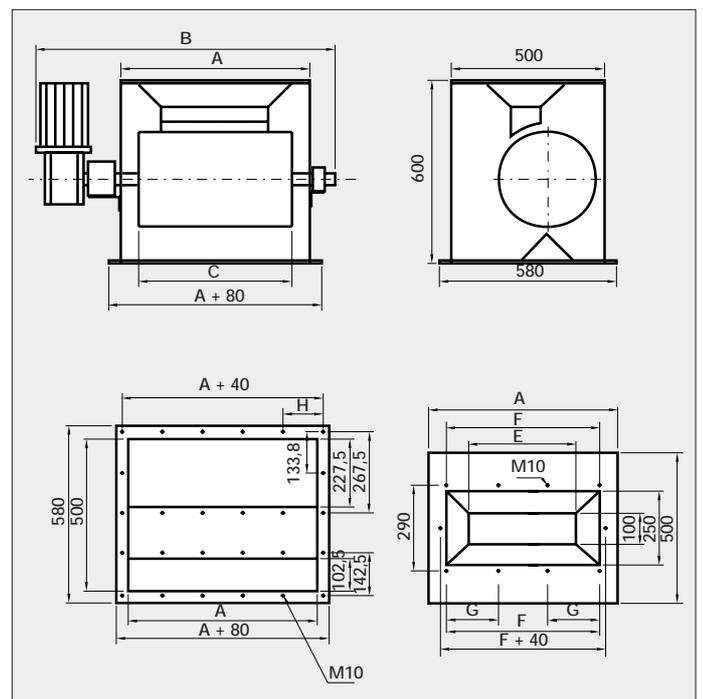
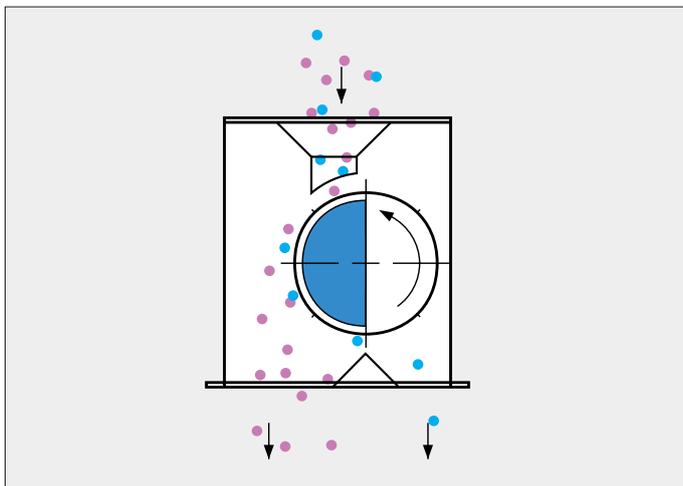
The components that come in contact with the material flow are manufactured from a very wear-resistant material. This means this unit is very suitable for separating ferrous particles from very abrasive materials.

The separating drum is driven by a shaft-mounted reduction motor. As well as the standard versions fitted with a ceramic magnet system, these types can also be supplied with the extra powerful Neodymium magnet system (add "/01" to the article number).



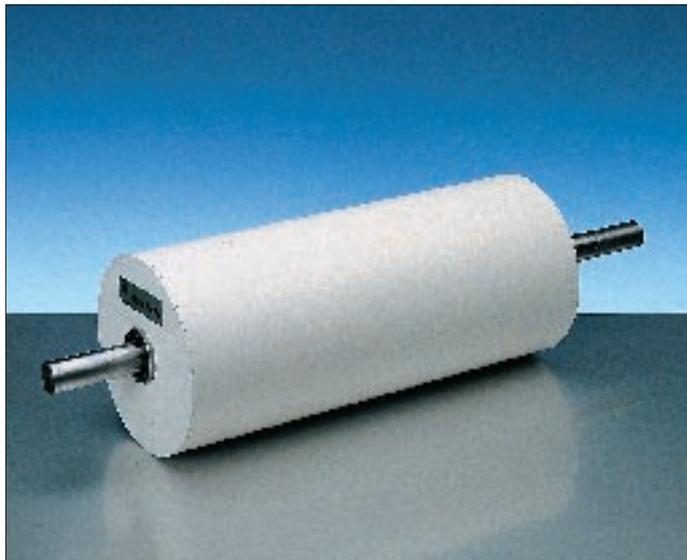
Art.no.	Width	A	B	C	E	F	G	H	wt (kg)
BM 29.149	250	340	700	250	100	250	2X125	2X190	130
BM 29.150	500	615	980	500	350	500	3X166	5X131	200
BM 29.151	600	715	1080	600	450	600	3X200	5X151	225
BM 29.152	750	865	1230	750	600	750	5X150	5X181	260
BM 29.153	900	1015	1375	900	750	900	6X150	5X211	300

All dimensions in mm



BM Head roller magnets

for conveyor belts



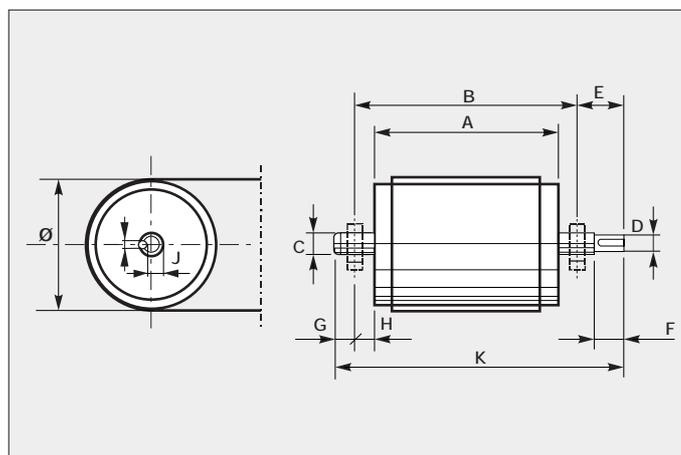
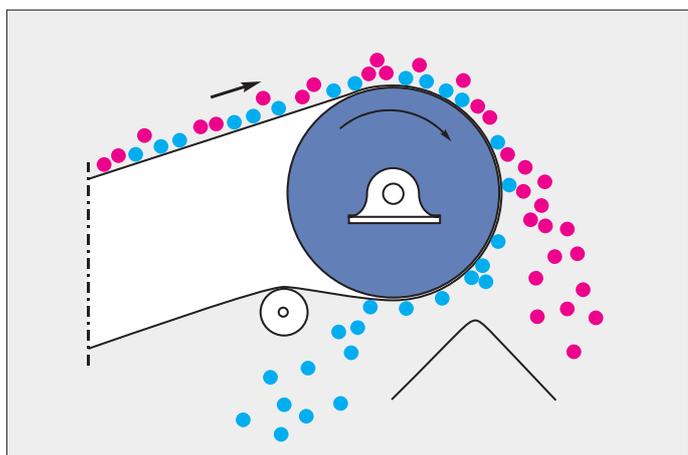
The magnetic head roller is a replacement for the drive roller at the end of a conveyor belt. In view of the wide variety of conveyor belts, the head roller magnets are supplied made-to-measure and ready for installation. As can clearly be seen from the illustration, the magnetic head roller pulls the ferrous particles out of the material flow and carries them through to the underside of the belt where they are dropped and collected. In the standard versions, the head roller is supplied with a longitudinal pole distribution which is suitable for thicker material flows and larger ferrous particles. If required, head rollers can also be supplied with transverse pole distribution for applications where there is less ferrous contamination and thinner material flows. A combination of a head roller magnet and an overhead system gives perfect separation.

BM 27.044...

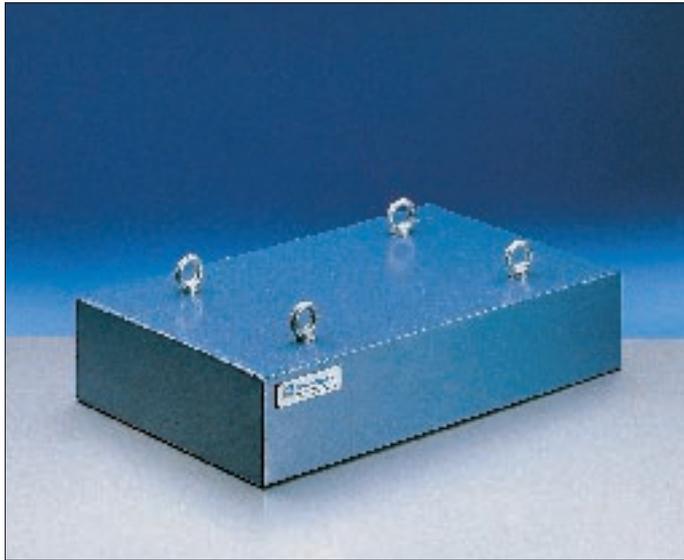
Art.no.	Belt	ø	capacity m ³ /h	Max. belt speed (m/s)	A	C	D	F	I	J	K	weight (kg)
BM 27.044*	400	215	14	0,8	500	40	32	119	10	27,0	909	75
BM 27.045*	500	215	17	0,8	600	40	32	119	10	27,0	1009	90
BM 27.046*	600	215	21	0,8	700	40	32	119	10	27,0	1109	100
BM 27.047*	650	215	23	0,8	750	40	32	119	10	27,0	1159	110
BM 27.048*	800	215	28	0,8	950	40	32	119	10	27,0	1359	130
BM 27.049*	1000	215	35	0,8	1150	40	32	119	10	27,0	1559	160
BM 27.050*	400	315	20	1,2	500	40	32	119	10	27,0	909	130
BM 27.051*	500	315	27	1,2	600	40	32	119	10	27,0	1009	140
BM 27.052*	600	315	30	1,2	700	50	48	153	14	42,5	1173	190
BM 27.053*	650	315	35	1,2	750	50	48	153	14	42,5	1223	195
BM 27.054*	800	315	45	1,2	950	50	48	153	14	42,5	1423	230
BM 27.055*	1000	315	55	1,2	1150	65	55	207	16	49,0	1717	280
BM 27.056	400	400	35	1,5	500	50	48	153	14	42,5	973	200
BM 27.057	500	400	45	1,5	600	50	48	153	14	42,5	1073	220
BM 27.058	600	400	55	1,5	700	50	48	153	14	42,5	1173	270
BM 27.059	650	400	55	1,5	750	50	48	153	14	42,5	1223	280
BM 27.060	800	400	70	1,5	950	65	55	207	16	49,0	1517	330
BM 27.061	1000	400	90	1,5	1150	65	55	207	16	49,0	1717	420

All dimensions in mm

* these types can also be supplied with the extra powerful Neodymium magnet system. Add "/01" to the article number.



BM Block magnets



BM 28.190...

Block magnets can be used for separating ferrous contamination from material flows on conveyor belts, during free fall, in vertical or sloping pipes and chutes, over slides, etc.

Effective magnetic field depth for block magnets

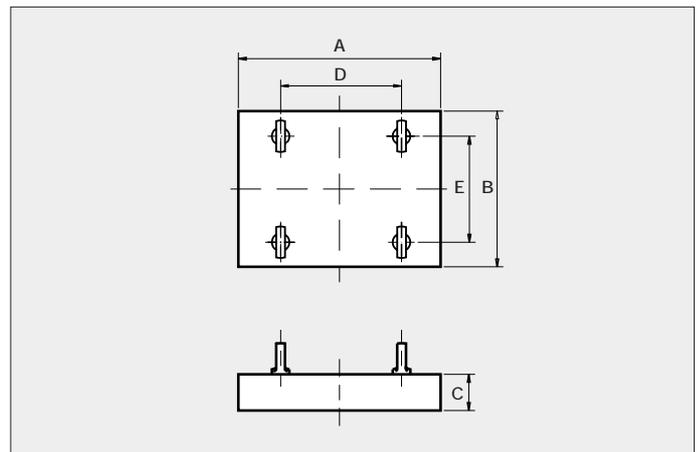
Art.no.	bar \varnothing 5x25	bar \varnothing 5x75	nut M16
28.190 t/m 28.192	165	225	130
28.200 t/m 28.210	255	370	180
28.230 t/m 28.240	260	380	195
28.310 t/m 28.318	295	430	225
28.320 t/m 28.328	315	460	240
28.330 t/m 28.340	335	480	250
28.353 t/m 28.367	360	500	275

Art.no.	A	B	C	D	E	*	weight (kg)
BM 28.190	520	310	130	310	185	M16	95
BM 28.191	720	310	130	410	185	M16	135
BM 28.192	920	310	130	550	185	M16	175
BM 28.200	430	505	180	260	305	M16	160
BM 28.201	530	505	180	320	305	M16	200
BM 28.202	635	505	180	380	305	M16	240
BM 28.203	735	505	180	440	305	M16	275
BM 28.204	835	505	180	500	305	M16	315
BM 28.205	935	505	180	560	305	M16	355
BM 28.206	1040	505	180	625	305	M16	395
BM 28.207	1140	505	180	685	305	M16	430
BM 28.208	1250	505	180	750	305	M16	470
BM 28.209	1350	505	180	810	305	M16	510
BM 28.210	1450	505	180	870	305	M16	550
BM 28.230	430	810	180	260	485	M16	265
BM 28.231	530	810	180	320	485	M16	330
BM 28.232	635	810	180	380	485	M16	400
BM 28.233	735	810	180	440	485	M16	460
BM 28.234	835	810	180	500	485	M16	525
BM 28.235	935	810	180	560	485	M16	590
BM 28.236	1040	810	180	625	485	M16	655
BM 28.237	1140	810	180	685	485	M16	720
BM 28.238	1250	810	180	750	485	M16	770
BM 28.239	1350	810	180	810	485	M16	850
BM 28.240	1450	810	180	870	485	M16	915
BM 28.310	835	610	247	500	365	M16	580
BM 28.312	1040	610	247	625	365	M16	740
BM 28.314	1250	610	247	750	365	M16	900
BM 28.316	1450	610	247	870	365	M20	1025
BM 28.318	1650	610	247	990	365	M20	1180
BM 28.320	835	810	247	500	485	M16	755
BM 28.322	1040	810	247	625	485	M16	990
BM 28.324	1250	810	247	750	485	M20	1145
BM 28.326	1450	810	247	870	485	M20	1375
BM 28.328	1650	810	247	990	485	M20	1575

Art.no.	A	B	C	D	E	*	weight (kg)
BM 28.330	835	810	350	500	485	M16	990
BM 28.332	1040	810	350	625	485	M20	1245
BM 28.334	1250	810	350	750	485	M20	1505
BM 28.336	1450	810	350	870	485	M24	1735
BM 28.338	1650	810	350	990	485	M24	1990
BM 28.340	1850	810	350	1110	485	M24	2240
BM 28.353	835	900	410	500	540	M20	1335
BM 28.355	1040	900	410	625	540	M24	1665
BM 28.357	1250	900	410	750	540	M24	1995
BM 28.359	1450	900	410	870	540	M24	2325
BM 28.361	1650	900	410	990	540	M30	2655
BM 28.363	1850	900	410	1110	540	M30	2975
BM 28.365	2050	900	410	1230	540	M30	3305
BM 28.367	2250	900	410	1350	540	M30	3630

* = 4x eyebolts C15 Din580

All dimensions in mm



for the waste disposal and recycling industries



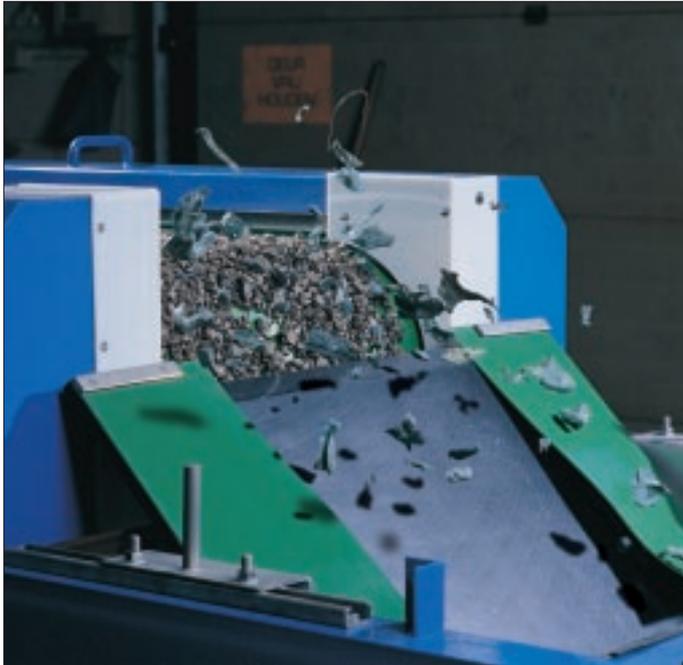
Bakker Magnetics supplies the range of new generation Eddy Current non-ferrous metal separation systems for use in, for example, the waste disposal and recycling industries. Through the introduction of a completely new 18-pole magnet cylinder, the efficiency is greatly improved. In many applications, the separation can almost reach 100%. In recent tests in the glass recycling industry, the efficiency reached 99.8%.

As well as the new generation of Bakker Magnetics Eddy Current metal separation systems, Bakker Magnetics supplies systems equipped with the conventional 12-pole magnet cylinder. These systems are suitable for removing non-ferrous particles greater than 9 mm. The Bakker Magnetics metal separators with the new generation magnet cylinder are optimised to separate particles greater than 2 mm.

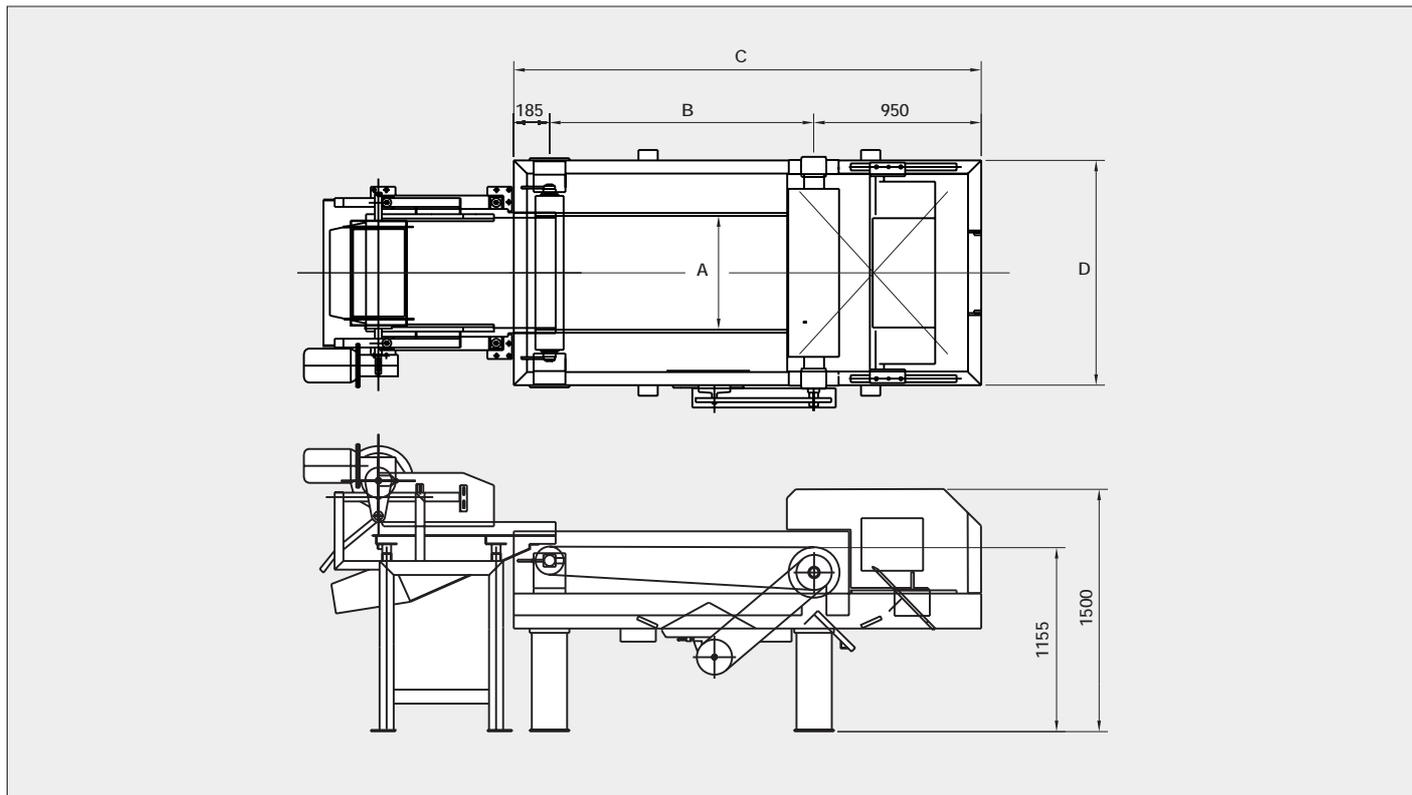
The table below contains the standard range of Eddy Current systems. Systems with non-standard dimensions and/or specifications on request.

All Bakker Magnetics non-ferrous metal separation systems are supplied as standard with:

- continuously adjustable conveyor belt speed from 0 to 2 m/s;
- continuously adjustable induction cylinder speed from 0 to 3000 rpm;
- conveyor belt with idlers equipped with dust seals on both sides;
- switch box for connection to the electricity supply;
- vibration sensors for detecting imbalances;
- double emergency stop switches on both sides of the machine;
- belt tracking control;
- internal magnet cylinder protected with the use of special plastics.



BM Eddy Current metal separation systems



Art.no.	A	B	C	D	power motor head roller (kW)	power motor belt (kW)	weight (kg)
BM 29.700	300	1515	2650	885	4	1,1	650
BM 29.701	500	1515	2650	1085	4	1,1	850
BM 29.702	650	1515	2650	1235	4	1,1	950
BM 29.703	800	1865	3000	1385	5,5	1,1	1100
BM 29.704	1000	2315	3450	1585	7,5	1,1	1300
BM 29.705	1200	2740	3875	1785	7,5	1,1	1500
BM 29.706	1500	3165	4300	2085	7,5	1,1	1800

All dimensions in mm.

Please complete the article number with an extension (/xxx) to indicate the following versions:

Model	Addition to Art.no.	Model	Addition to Art.no.
Standard conventional non-ferrous metal separator with 12-pole magnet cylinder, optimised for particles from 9 mm.	/12	Standard separation drum supplied as option to metal separator. Only in combination with vibrating feeder. (Dimensions on request.)	/30
New generation non-ferrous metal separator with 18-pole magnet cylinder optimised for particles from 2 to 15 mm.	/18	Separate standard induction roller with 12-pole magnet cylinder optimised for non-ferrous separation of particles from 9 mm	/112
Standard vibrator supplied as option to metal separator. (Dimensions on request).	/20	Separate new generation induction roller with 18-pole magnet cylinder optimised for particles from 2 to 15 mm or usable as head roller for separating stainless steel.	/118

A detailed brochure about Bakker Magnetics Eddy Current metal separation systems is available on request.

Raw materials contaminated with metals are present in many industries. This contamination is unwanted for many reasons. For example, small ferrous or non-ferrous particles can cause damage to machinery, and in the food and feed industries, the presence of metal particles in the finished product is not acceptable. To a large degree, this is also true for the products of the recycling industry. In many cases there are legal requirements concerning the presence of metallic contamination in its end products. Protecting expensive production equipment and a significant improvement in the quality of the end product are important arguments for installing Bakker Magnetics metal detection and separation systems.

Cost reductions through investment

Any interruption or waste in production processes creates costs - costs through loss of production, and extra maintenance and/or repairs to your expensive machinery. The total of these costs can sometimes be far more than the investment needed for one or more Bakker Magnetics metal detection and/or separation systems. Furthermore, thorough metal separation improves the quality of your end product to an important degree.

Compact Bakker Magnetics free fall metal detection and separation unit



Various models

Metal detection and separation systems are available in different models each with its specific application possibilities. The main groups which we identify are:

- free-fall systems;
- systems used in combination with conveyor belts;
- systems used, for example, in combination with injection moulding machines.



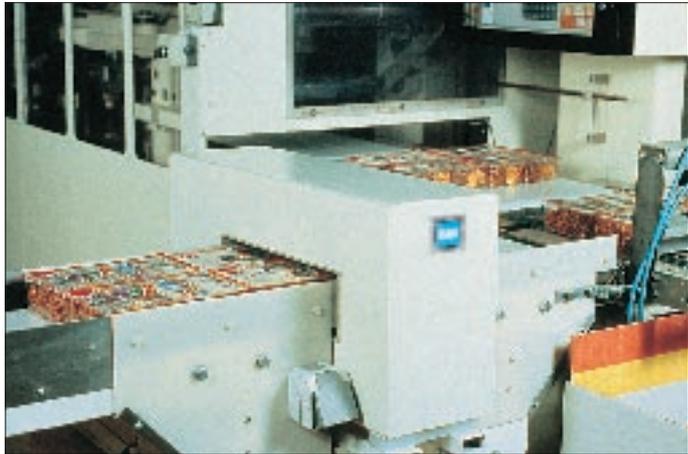
Control unit for Bakker Magnetics systems with product compensation

Bakker Magnetics metal detection and separation system for the food industry



Some important characteristics of the Bakker Magnetics metal detection and separation systems are that they:

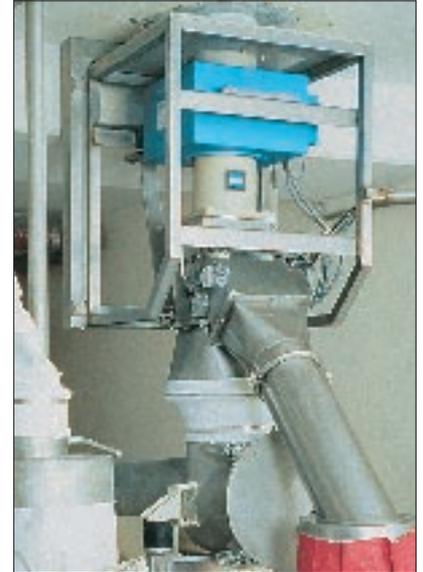
- detect all metals, ferrous and non-ferrous;
- are very sensitive;
- have small dimensions;
- generate small material loss with discarded metal particles;
- have a large processing capacity;
- have an accuracy > 99% also with enclosed metal particles;
- have automatic temperature compensation;
- use an inbuilt self-diagnosis system to warn of breakdowns;
- enable the rapid removal of contamination;
- use a pneumatically operated ejection system;
- have high reliability;
- need little maintenance;
- have a very durable, robust construction;
- are simple to install;
- have a long life.



Examples of applications for Bakker Magnetics metal detection and separation systems

Food and feed industries

Removal of all metal contamination from raw material flows, detection of metal particles in end products such as meat products, milk powder, flour, confectionery, etc. Installation in production process, for example, for preparing ice-cream, dairy products, etc.



Textile industry

Checking clothing, furniture and curtain materials.

Plastics industry

Checking and decontaminating plastic granules, checking end products such as plastic equipment casings, packaging materials, etc. Checking the raw materials entering machinery, for example, injection moulders.

Glass and ceramics industry

Checking and decontaminating raw materials, sand, recycled glass, stone, porcelain, etc.

Recycling industry

Checking and decontaminating the end products of the recycling processes, such as plastics, soil, shredded raw materials, etc.



A detailed brochure about Bakker Magnetics metal detection and separation systems and data sheets are available on request.

Several tips for using industrial ferrous separation systems

The magnet system in ferrous separation applications as used for raw materials is built from permanent magnets or electromagnets, plus other components some magnetically conducting and others not. Bakker Magnetics pays particular attention during the design and construction of magnet systems to the design and dimensions of the various components. Even the combination of the various material properties is of utmost importance in arriving at a system with the best performance. To ensure that this excellent performance is retained in during operation, particular attention must be paid to the choice of components used when constructing the conveyor belt for use with the ferrous separation unit. For example, you shouldn't use any magnetically conducting materials in the operational area of the magnet system. If you do, these materials could become magnetised which would lead to accumulations of ferrous contamination in the wrong places or adversely influence the efficiency of the ferrous separation process. Materials that can be used in the construction are, for example, aluminium, brass, stainless steel (AISI 300 series) and plastics. Bakker Magnetics' technicians will be pleased to advise you on integrating ferrous separation systems in your environment. In the construction of magnet systems, various magnetic materials can be used. The selection is made depending on the requirements which can vary from situation to situation. Some of the groups of materials frequently used by Bakker Magnetics are explained in the following sections.

Ceramic

This magnetic material is used in many in ferrous separation systems. In normal use, a lifetime guarantee is given for its magnetic properties. The material can be recognised by its matt black colour.

AlNiCo

AlNiCo is an alloy made from aluminium, nickel, cobalt and steel. It is used in situations where great mechanical strength is required. The material is also able to withstand high temperatures and temperature changes. It is recognisable by its typical metallic appearance.

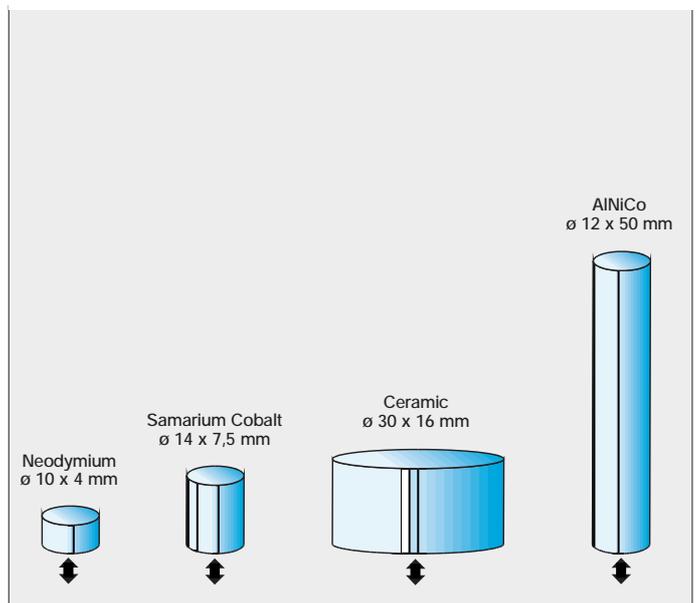
Samarium Cobalt

Samarium Cobalt is a powerful magnetic material made from rare earth minerals. It is almost impossible to demagnetise and always retains a very strong magnetic power. The material can be recognised by its dull metallic colour.

Neodymium

This is the strongest magnetic material currently available. It is used in situations which demand a very thorough ferrous separation. Bakker Magnetics uses this material in systems for separating ferrous contamination from raw materials in which very small particles (μ range) are present or the types of steel to be extracted have weak magnetic properties. Neodymium magnets can also be used successfully for ferrous separation from viscous fluids. Neodymium is a rare earth material.

Comparison of dimensions of magnetic materials with equal magnetic power



Temperature stability of magnetic materials

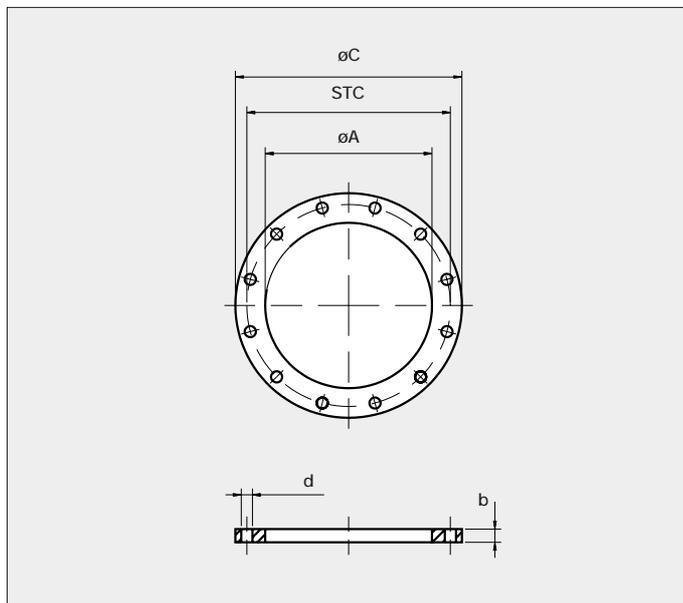
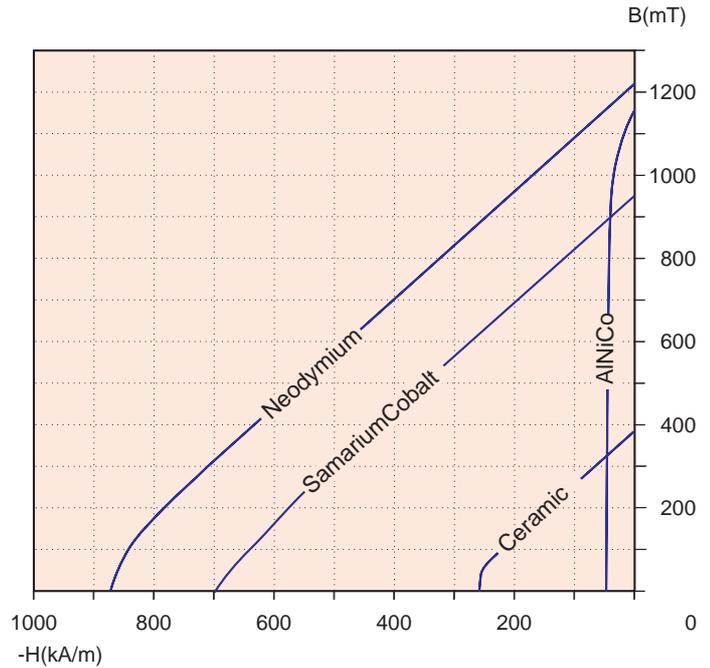
Generally, the effectiveness of a magnet or a magnet system drops as the temperature rises. In practice, this has to be taken into account only rarely because most applications run at normal ambient temperature. However, every magnetic material has a critical temperature at which its magnetic properties can be damaged. If the limits are not exceeded, the loss of magnetic power will only be temporary and the original magnetic power will be regained when it cools. Naturally, it is sensible to keep a good safety margin. For applications in which there is a chance that higher temperatures could occur, it is recommended to seek advice from Bakker Magnetics in advance. Our extensive experience gained over many years in the application of magnet systems in industrial environments ensure the best solution for every ferrous separation problem.

Custom-made ferrous separation and metal detection systems

Bakker Magnetics' field engineers will be pleased to assist you in specifying the optimum solution for your specific ferrous separation problem. If you would like to make use of this service, please fill in a copy of the questionnaire on page 38. You will then quickly get your tailor-made advice.

Magnetic properties

Magnetic properties	BHmax	Br	IH _c	Rel. strength	Curie temp.
Rel.strength	KJ/m ³	mT	kA/m		°C
Ceramic	27,8	390	255	100	450
AlNiCo	44	1270	51	80	860
Samarium Cobalt	154	890	1200	400	720
Neodymium	280	1150	1000	500	310



DIN 2576 flanges

Various Bakker Magnetics ferrous separation systems are fitted with flanges which conform to the DIN standard 2576 D10 NW. In particular, the sanitary models of the pipeline magnet systems are fitted with them. In the following table and illustration, the dimensions of the various types are shown.

DIN 2576 ND10 NW flanges

Nw	ISO øA	øC	b	number of holes	d	STC
50	60,3	165	18	4	ø18	125
100	114,3	220	20	8	ø18	180
150	168,3	285	22	8	ø22	240
200	219,1	340	24	8	ø22	295
250	273	395	26	12	ø22	350
300	323,9	445	26	12	ø22	400

Questionnaire for obtaining advice on a ferrous separation system.

Customer:

Company name : _____
Contact person : _____ Reference: _____
Address : _____
Postcode and town : _____
Telephone : _____ Fax _____

Product from which the ferrous particles are to be separated:

Material : _____
(If it is a mix or a blend of materials, state the individual components please.)
Specific gravity : _____
Bulk density : _____
Capacity : _____
Particle size : _____
Particle form : _____
Moisture level : _____
Temperature : _____
Material sample available : Yes/No
Additional information : _____
e.g. pH value, abrasiveness, etc.

Ferrous contamination:

Type : _____
Particle size : _____
Particle form : _____
Percentage : _____

Transport system:

For installation in or above conveyor belts an/or vibration chutes

Type of conveyor belt : _____
Belt width : _____
Width of material flow : _____
Belt speed : _____
Installed angle : _____
Product layer thickness : _____
Belt material : _____

For installation in pipeline systems, hoppers, etc.

Type of pipeline system : _____
Dimensions/Diameter : _____
Pneumatic transport : Yes/No pressure: _____
Drop speed : _____
Material : _____
Additional information : _____

Location:

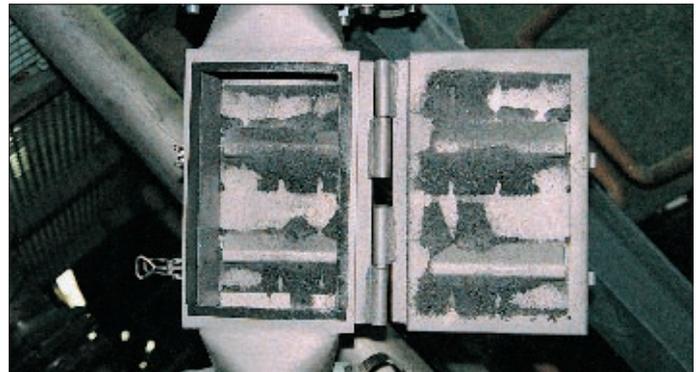
Voltage present : _____
Air pressure present : Yes/No pressure: _____
Special regulations : _____
Ambient temperature : _____
Additional information : _____



To ensure that the continuous process is not interrupted, a double outer system is used in this application



Separating drum used in the rubber recycling

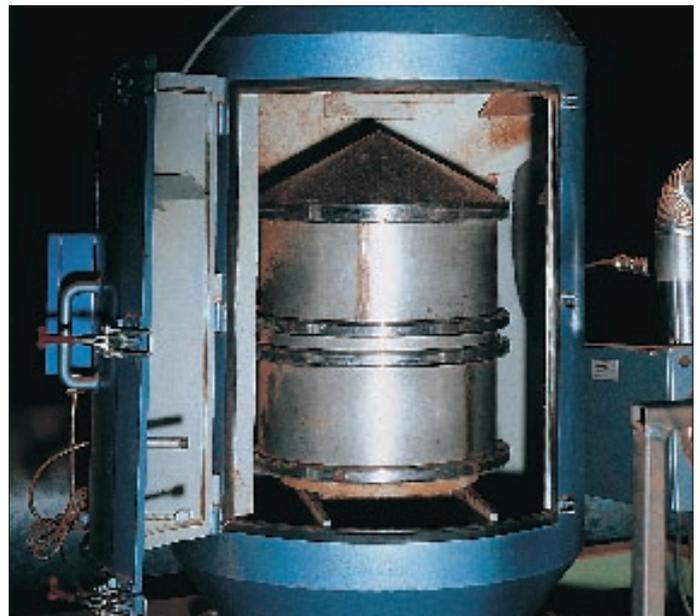


Open chute magnet in the plastics industry. The collected iron contamination is clearly visible



Bakker Magnetics magnetic filter in hygienic version

Bakker Magnetics reserves the right to change the technical specifications stated in its publications without notice. The values given in these specifications are nominal values and are dependent on the application. It is recommended to contact the Bakker Magnetics' sales department for further information on the availability and specifications of the selected products and systems before commencing the implementation and/or development of the product.



Pipe magnet in use in tea packing



Bakker Magnetics

Bakker Magnetics b.v.
Ekkersrijt 1306
5692 AH Son The Netherlands
Tel. +31 (0)499 - 474 550
Fax. +31 (0)499 - 476 263

From October 6th 1997
Science Park Eindhoven
5692 EL Son The Netherlands
Tel. +31 (0)40 - 267 86 78
Fax. +31 (0)40 - 267 88 99