

# Magnets

# Metal detectors

# Metal Separators

Metallic contamination in food and foodstuffs cannot be tolerated. Metals and their compounds can be detected in different kinds of bulk products, liquids or compounds. Different methods are available:

- magnetic separation (only for iron and iron associations)
- metal detection, suited for all kind of metal like stainless steel, brass, aluminium, gold, copper etc.

The separation of pure magnetic metals can easily be achieved with permanent magnets. Depending on the required strengthness of the magnet different materials like Ferrit or Neodyn (high capacity magnets) are used.

Electromagnets are rarely used (power failure).

Magnets are available as simple rodmagnets, as plate magnets, gridmagnets or flow magnets for bulk products, as filter magnets for liquid or compound products.

For coarse classification of bulk material or recycling products also the overbelt magnets can be used. Magnetfilter or magnetgrids can be constructed as single- or multilayer. The magnets are manufactured according to customer requirements. In contrary to the magnetic separation the functional principle of metal detectors and separators is different.

## "All metal detectors/-separators"?

These units are able to sense iron as well as non-iron metals in products. All metal detectors find their application in the whole range of the food industry. They increasingly replace the mere magnets. Only they offer top safety regarding all kinds of foreign materials in bulk material, flours, ready-made products, etc. The varied construction covers a wide application range. All metal detectors cannot avoid the pollution of products with metal parts but they ensure a safe and reliable detection of those contaminating parts. Therefore damages to human beings or animals can reliably be avoided.

### Function

**Metal detectors** consist of two components: the detection coil and the electronic.

**Metal separators** consist of three components: the detection coil, the evaluation electronic and the separation device. Depending on the application and the requested detection effect technically different systems are used:

**Pulse-induction process:** here a coil is used which alternately operates as transmitter and receiver. Swirling streams are caused in the detected metal parts by a sender pulse reflected with high energetic density. The slow dying out of these swirling streams enable the coil, now set to receiving, to detect this signal.

**Vaporized alternating field:** Basic construction of metal detector. A coil is integrated into an oscillatory circuit and oscillates with natural frequency. As soon as a metal part enters this energetic field it abstracts energy from the coil which causes a change of the frequency of the oscillator which will be evaluated by the electronic.

**Transmitter-receiver principle:** (generally applied) In this system three coils that do not disturb each other in a metal-free stream of product are used. One operates as the transmitter, two as receivers. A foreign part now causes a disturbance of the electromagnetic field. The disturbance sensitivity is decreased by the obligation of both receiving coils to transmit an equivalent signal. This process has the advantage of a certain learning effect for the electronic so product effects like salt, moisture etc. can be faded-out. This system therefore finds its main application in the food industry.

**Systems with magnetic fields for aluminium-packed products:** metal detectors are able to detect coloured metals, special steel, iron, etc. in packed and unpacked products. Excluded are aluminium packing materials only (bags, buckets). For this application only systems with magnetic fields can be used. Their function greatly differs from those of the earlier mentioned systems. Main component is a tunnel in which a strong magnetic field is created. Each magnetic material in the tunnel is magnetized, their field strength is registered by a row of detection coils installed in the tunnel. These units are able to detect iron metals under aluminium foils; they cannot detect coloured metals, special steel etc. Their operational area is therefore quite limited and is not suitable in the food industry since there are many special steels in used.



**Agromatic AG**



Technische und massliche Aenderungen im Sinne des Fortschrittes behalten wir uns jederzeit vor

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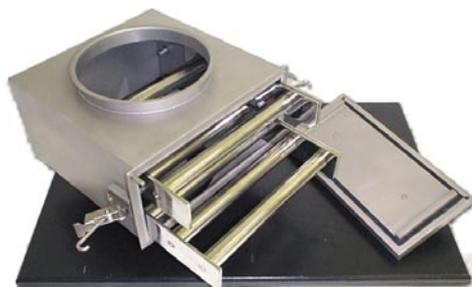
## Magnets / standardversions or ATEX versions

For details please see detailed datasheets



### AGM

**Magnetic grids**, construction in stainless steel 1.4301 either electro polished or with special abrassive surface coatings. With closed (tight) magnets or with open magnets. Construction as round grid or square/rectangular grid. Can be supplied open or complete with drawer housing. Pressure resistant construction supplied with housing and connection flanges. Also available as easy cleaning version.



### AMXF

**Magnetic grids**, multilayer in housing. Layout in stainless steel 1.4301 either electro polished or with special abrassive surface coating. With closed (tight) magnets or with open magnets. In-/outlet round or square. With DIN flanges, Jakob flange or blunt. Standard diameter 100 - 400mm



### AGMX

**Magnetic grids**, multilayer in housing with special thin magnet rods for special applications like spices etc. Construction stainless steel 1.4301 either electro polished or with special abrassive surface coatings. With closed (tight) magnets or with open magnets. In-/outlet round or square. With DIN flange, Jakob flange or blunt. Standard diameter 100 - 400mm



**ARX- Rotating magnetic grids**, easiest cleaning. All magnet rods can be taken out in one piece. Complete with motor, compact construction.

Construction in stainless steel 1.4301 wither electro polished or with special abrassive surface coatings. With closed (tight) magnets or with open magnets. In-/outlet round or square. With DIN-flanges, Jakob flange or blunt. Standard diameter 80 - 500 mm



### ATM

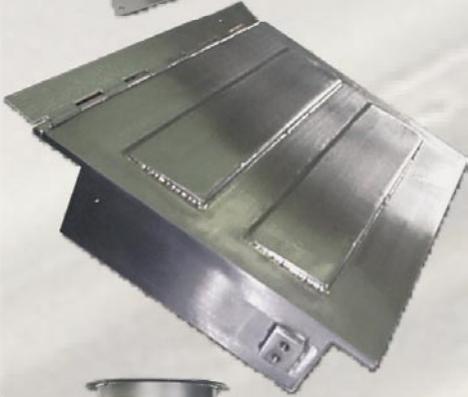
**Open drum magnet**. Open magnet drum for mounting in existing housing.

Attention: housing preferably in stainless steel 1.4301 With shaft ends with key slot. Pre-assembled bearing blocks. Drum in stainless steel, deflector not included. Magnetfield and position marked on drum. Tight construction. Drum diameter 215/315 und 400mm, drum length 400 to 1000mm



#### ATMG

**Drum magnet**, complete with housing, deflector and drive. Housing in stainless steel 1.4301. Drum diameter 215 / 315 and 400mm, drum width 400 to 1000mm, width of housing 610 to 1210mm. In-/outlet rectangular, either with in-/outlet flange or welded flange  
Optional supply with Samarium-Cobalt high temperature magnet system



#### AMP

**Magnetplates, over belt magnet** in countersunk or setup version. Size of plate, magnet types and construction of magnets according to requirements, standard plates in length of 200 to 1000mm and width of 200 bis 800mm. Construction height between 200 or 300 mm, depending on magnet version.  
Supplied as closed rectangular housing, with construction frame or with countersunk flange. Housing in stainless steel 1.4301. Closed rectangular housing with mounting devices, flange versions without allurement



#### ARM

**Pipemagnets with or without separation**, Standard pipe magnets for free flowing bulk products with central kern magnet. Housing in stainless steel 1.4301 with large swivelling-door for easy cleaning of the magnet.  
Either with welded nipple, flanges or Jakob flanges. Diameter standard 200 to 600mm.  
The same unit can be supplied with electro magnet instead of permanent magnet and separation gate.  
With high contamination a periodical automatic cleaning is possible. This magnet is especially used for recycled shredded wood like pallets (nails). The gate is varnished in standard steel or supplied in stainless steel version.

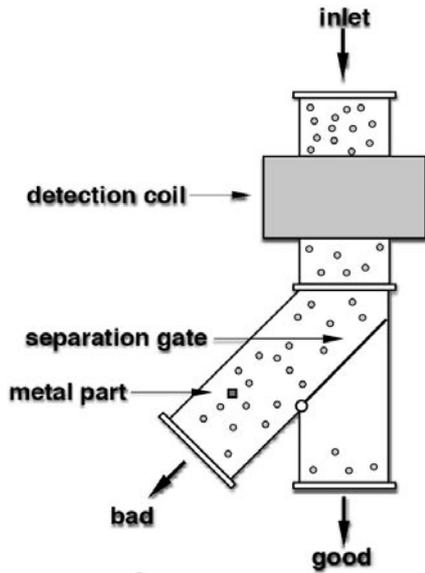
(see picture: attention, housing only for version with separation gate)



**AGHD and APG grid magnet units** for high pressures and usage in pneumatic lines (compound, liquids etc) for normal or high temperatures. Construction only with flange connection or pipe connection. With end switch if desired. Easiest cleaning, food save construction (100% stainless steel 1.4301 electropolished)  
Version (right) for pressure or suction pneumatics  
Fix magnet grid or with rotating drum magnet.  
Stainless steel construction 1.4301. Also available with end switch. Construction only with flange connections or pipe socket for moulded boltings.



## All metal detection



### The principle of metal detection

The basic principle remains the same if free falling application, pressure or suction pneumatics, belt detection (small or large packages) Via the detection coil (transmitter - receiver) a single or multi frequency signal is created and the interference resp. reflection of the signal is evaluated via the electronic module.

The electronic unit controls the separation system of any kind no matter if clap, valve, pusher, air pressure separation etc. in order to eliminate the contaminated product.



### Components:

Round coils with detection pipe or rectangular coils with detection shaft with separate electronics in single or multi frequency technique depending on the application. Coils for vertical and horizontal operation. Diameter 30 - 700mm (round) and 150 x 800 rectangular/square horizontal or upright position



### AGLS

Detection unit rectangular or round coil complete with attached electronic unit. Application on specially isolated transportation belts. Standard coils rectangular horizontal or upright position of 150 to 800mm passage height/width. With external or fix installed electronic unit.



### AMS ...Serie

All metal separation units for free flowing products with attached separation guide. Standard pipe construction with diameter 80 - 500mm (preferably foodstuff), made of stainless steel 1.4301 with quick closing guide. Sensing pipe in standard, antistatic or ATEX certified for zone 20. Blunt pipe connections, Jakob raised edge or flanges. Same model in rectangular pipe construction, application especially for plastic granulates, in construction normal steel or stainless steel 1.4301. Connections via standard flanges. Same model however in vario layout. Easy adaptation on existing pipe construction (unsuitable for flour). All units can be supplied with an MD2 electronic or with MD1 electronic with internal record. Depending on product in single- or multi frequency technique, special construction for products with high temperatures (after dryers, expanders etc.)

### AGF ... Serie

#### All metal detector and separation unit for pressure or suction pneumatic, for vertical or horizontal assembly

With this unit a reliable contaminant separation in pneumatic lines is possible without pressure drop or pressure changes in the pneumatic line. The material flow in the pneumatic is not obstructed, the continuous operation is guaranteed. Can be supplied for standard pipediameter 70 / 80 / 100 / 120 / 150 and 200 mm.

Application range especially for floury products due to multi frequency technique also suited for different product mixtures (baking flour mixtures).

Construction in stainless steel 1.4301 incl. all gates. Length of sensing pipe can be adjusted acc. to the different conveying velocities (m/sec airstream). Sensing coil adjustable acc. to available separation time on sensing tube.

Sensing tube in standard or ATEX construction (antistatic for product touching parts in zone 20).

Supply complete with control unit, ready for operation.

Directly connected or separate electronic unit MD1 with internal record. Data transfer to superior data system. Due to compact construction very high sensitivity.

Large, impact resistant separation unit which enables pressureless separation in collection container etc.

Supplied as complete unit on stainless steel assembly/suspension-frame.



### AGK Agrocont metal separation belts

for special usage after packaging line for small packages. In stainless steel 1.4301 especially for metal detection belts

With rectangular coils or upright position. Depending on customer requirements and product with or without separation unit e.g. pneumatical pusher, air blast system in connected bucket or colour marker. The belts are manufactured according to customers requirements with standardized components as horizontal, sloping, or declining

motordriven spindle foot, adjustable in height. The layout of the conveyor belts depend on the application and they can be supplied food safe. The conveying belts can be manufactured with burlings/bars or as flat belts. By means of the variodrive an adaptation to the production velocities is possible.

Depending on the application range of the belts they are supplied complete and ready for operation with standard of MD1 electronics in single or multi frequency technique. An integration in the existing control process is possible without any objection.





**AGKS Agrocont heavy duty** metal detection belt without separation however with marking or input signal to external gate. For packages, bags etc. in the range of 40 to 120kg (depending on bulk weight). Can be supplied as belt with fix assembly or as transportable belt with electrical or mechanical height adjustment. Optionally with guide rails. Preferably with electronic unit MD1.

**AGKSR Agrocont heavy duty** with half-shell round belt, especially suited for the sawmill industry for checking whole tree trunks on contaminations by metal parts. Detectioncoil round, aperture 600mm. Transportationbelt in normal steel, varnished. Detectioncoil in stainless steel with baffle plate. Electronic unit MD1.



**Electronic units:** various electronic units for different applications are available. Starting with the simple "good - bad" display up to the comfortable MD1 for single or multi frequency technique. The operation of the units is very easy. Depending on the comfort level the control units are equipped with password protection and internal record, deletion protected which allows security check acc. to HACCP guidelines. The numerous interfaces allow easy integration of the units into superior PCs or control systems. Direct connection of log printers is possible.

### Safety concept for mills - for the feed mill industry and allied industries

#### Magnets and metal detection in combination

In applications where larger amounts of magnetic materials appear we recommend the usage of combined magnets and metal detection units.

First use the magnets and thereafter the metal detectors. Thus it can be avoided that larger amounts of separated material

must be examined on contaminations. For this kind of combined usage of both machines we can give you useful advice of working solutions. Our technician will be obliged to offer consulting services in this respect.

**Agromatic** offers a complete safety system for the food industry:

- full- empty indicators for containers- silos etc in the different technical constructions
- Continuous level measurement for buckets and silos for bin height up to 65m
- Conveyor safety control (speed, differential speed, alignment at top and base, storage temperature and bearing temperature control, everything with combined electronics (zone 20 to safety range 4)
- Spark detection- and extinguishment systems for the feed industry, wood processing enterprises (pellets) as well as sugar and pharma industry.
  - metal detection with magnets
  - metal separation
  - metal detection and separation for the recycling industry
  - contaminant detection by x-ray technology

**Agromatic** units are tested and certified acc. to ATEX zone 22/21 and 20 (depending on application)