Degaussing

From Small to Large
Vallon GmbH

Vallon GmbH has been developing and producing degaussing tools and degaussing systems since 1965. Our experience allows us to offer a versatile and high-capacity product range. Besides our standard degaussing coils and yokes for many applications, we supply special customized solutions, ready for connection. In our own application laboratory, we develop - in close cooperation with the customer - the best degaussing solution, considering not only technical but also economical aspects.
Coils
Coils

Functional Principle

Degaussing coils (also referred to as degaussing tunnels) create an alternating magnetic field in the direction of their passage axis.

Degaussing is performed by a continuous movement of the work piece through the coil, and leading out of it. Decreasing field strength is achieved by slowly extracting and removing from the coil.

The density of magnetic field lines is at its maximum in the coil centre, and is strongly decreasing towards the outside (see graph 1). If a ferromagnetic steel work piece is introduced into the coil, the field lines are concentrating and flooding the workpiece. The magnetic conductivity of steel is approx. 800 times higher than that of air. (see graph 2).

Since the field lines inside the coil run parallel in relation to its axis, the coil is best suited for degaussing of flat work pieces containing magnetic fields in longitudinal direction.

Construction

We generally offer two universal construction types: The “EM” series degaussing coils are made of solid aluminum castings, and the “VEM” series coils are built of stainless-steel coil segments. Owing to our well-proven and versatile modular system using stainless steel coil segments, passage height and passage width as well as coil length can be freely adapted to any customized demand considering existing production situations. The type series made of aluminum castings allows a large selection in terms of passage width and passage height within a given grid dimension of 50 mm.

In most cases, the aluminum body is sufficient for heat dissipation. Coils with extremely strong magnetic fields are equipped with a rotary axial blower and a temperature control system.
Small Coils

For degaussing of smaller steel parts as pins, screw drivers, etc., we recommend our small degaussing coils.

The plastic housing (reinforced with glass fibre) comprises the coil itself, a plug for the mains cable and a carrying handle. An integrated thermo contact protects the coil (for EM0402, EM1005) from overheating.

Power supply:
• 230 V/50 Hz
• 115 V/60 Hz (on demand)

<table>
<thead>
<tr>
<th>Type (Examples)</th>
<th>Passage width mm</th>
<th>Operation time</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM0402</td>
<td>40 x 20</td>
<td>30 min</td>
</tr>
<tr>
<td>EM1005</td>
<td>100 x 50</td>
<td>30 min</td>
</tr>
<tr>
<td>EM1010</td>
<td>100 x 100</td>
<td>permanent operation</td>
</tr>
</tbody>
</table>

Round Coils

For medium-sized tubes or rods, we offer degaussing coils with round passage, standard diameters 60 mm and 120 mm.

Customized coils can be produced to specification, e.g. 20 mm or 30 mm, etc. The denomination of the coil type corresponds to the passage size in cm.

Power supply customer specific:
• 230 V/50 Hz or 400 V/50 Hz
  (other power configurations on demand)
• LF-Generator EG2422 (for „B“ series coils)

<table>
<thead>
<tr>
<th>Type</th>
<th>Passage width mm</th>
<th>Length mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM03</td>
<td>30</td>
<td>180</td>
</tr>
<tr>
<td>EM06</td>
<td>60</td>
<td>120</td>
</tr>
<tr>
<td>EM12</td>
<td>120</td>
<td>180</td>
</tr>
</tbody>
</table>
Rectangular Coils EM

For small to medium-sized work pieces, single or as bulk goods or goods on tray, in containers or in a basket, etc. Our modular system using aluminum castings enables many different coil dimensions and shapes.

Standard passage height and passage width can be adapted in steps of 50 mm, e.g. from 210 mm x 60 mm to 510 mm x 510 mm.

The dimensions of the coil in cm determine its denomination. Example EM2116: passage width = 21 cm and inner height = 16 cm.

<table>
<thead>
<tr>
<th>Type (Examples)</th>
<th>Passage width mm</th>
<th>Length mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM2106</td>
<td>210 x 60</td>
<td>270</td>
</tr>
<tr>
<td>EM5151</td>
<td>510 x 510</td>
<td>270</td>
</tr>
</tbody>
</table>

Rectangular Coils VEM

This type allows more flexibility in terms of size permitting almost any format.

Our modular system based on pre-finished stainless steel coil segments have a standard passage width from 60 x 60 mm up to 510 x 510 mm feasible within grid dimensions of 50 mm. Special sizes with different grid dimensions and other coil lengths are available on demand.

The dimensions of the coil in cm determine its denomination. Example VEM2116: passage width = 21 cm and inner height = 16 cm.

<table>
<thead>
<tr>
<th>Type (Examples)</th>
<th>Passage width mm</th>
<th>Length mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>VEM1111</td>
<td>110 x 110</td>
<td>262 (or on demand)</td>
</tr>
<tr>
<td>VEM5151</td>
<td>510 x 510</td>
<td>262 (or on demand)</td>
</tr>
</tbody>
</table>

Power supply customer specific:
- 230 V/50 Hz or 400 V/50 Hz (other power configurations on demand)
- LF-Generator EG2422 (”.B” series)
- LF-Pulse generator EG2422P (”.P” series)
Coils

High Performance Coils  C
„C“ Series of up to max. 710 x 710 mm

For thick-walled work pieces, this coil offers an increased performance, in connection with low frequency generator EG2422S.

Passage height and passage width are available in steps of 50 mm, as for example from 110 x 110 mm up to 710 x 710 mm.

Power supply:
• Low frequency generator EG2422S

<table>
<thead>
<tr>
<th>Type (Examples)</th>
<th>Passage width mm</th>
<th>Length mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM1111C</td>
<td>110 x 110</td>
<td>410</td>
</tr>
<tr>
<td>EM3141C</td>
<td>310 x 410</td>
<td>410</td>
</tr>
<tr>
<td>EM6161C</td>
<td>610 x 610</td>
<td>410</td>
</tr>
</tbody>
</table>

High Performance Coils A
„A“ Series of up to max. 2000 x 3000 mm

For extremely hard steels and / or large work pieces, we offer degaussing coils with extremely high field strength (in connection with low frequency generator EG2440 or EG2450).

The inner passage height and width can be modified according to customer specifications in steps of 50 mm, as for example from 110 mm x 110 mm up to 2000 mm x 3000 mm or larger. Heat dissipation is assured by a rotary axial blower or optional by liquid cooling; in addition, the temperature is controlled continuously by the low frequency generator.

Power supply:
• Low frequency generator EG2440
• Low frequency generator EG2450

<table>
<thead>
<tr>
<th>Type (Examples)</th>
<th>Passage width mm</th>
<th>Length mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM5151A</td>
<td>510 x 510</td>
<td>410</td>
</tr>
<tr>
<td>EM70101A</td>
<td>700 x 1010</td>
<td>410</td>
</tr>
<tr>
<td>EM161161A</td>
<td>1610 x 1610</td>
<td>410</td>
</tr>
</tbody>
</table>
Rotary Field Coils

For degaussing ring-shaped workpieces (like tubular springs, piston rings) already packed as rolls, we offer our rotary field coils.

These special rotary field coils create a strong low frequency rotating magnetic field within the passage zone (in connection with low frequency generator EG2422R).

Here, the magnetic field penetrates the workpieces vertically, and rotates inside the individual part. When guiding the ring stack slowly through the coil, each individual ring is optimally demagnetized without creating residual magnetism at the touching points.

To assure the precise guiding of the packs through the coil at a constant distance on all sides, a centering device of stainless steel is mandatory.

Tunnel Coils

For degaussing of pipes, rods or similar at high transport speeds (>3 m/sec), we offer customized long coils.

The extended magnetic field of such a tunnel coil allows several reversions of the magnetic polarity of a workpiece while passing through the coil.

Power supply:
- 230 V/50 Hz or 400 V/50 Hz
  (other voltages on demand)
- LF-Generator EG2422 (for “B” series)

<table>
<thead>
<tr>
<th>Type (Example)</th>
<th>Passage width mm</th>
<th>Length mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM12S-650</td>
<td>120</td>
<td>650</td>
</tr>
<tr>
<td>EM06-400</td>
<td>60</td>
<td>400</td>
</tr>
<tr>
<td>EM03-400</td>
<td>30</td>
<td>400</td>
</tr>
</tbody>
</table>
Yokes
Yokes

Functional Principle

Degaussing yokes create a magnetic degaussing field which emerges vertically from the active surface. Therefore, degaussing yokes are ideally suited for vertically positioned bar-shaped work pieces and horizontally positioned discs, plates or roller bearings, etc.

The maximum intensity of the magnetic field is at the upper surface of the yoke, and is then decreasing quickly.

Examples of designation:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Power Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMJ05</td>
<td>Active degaussing width 50 mm,</td>
<td>230 V 50 Hz</td>
</tr>
<tr>
<td>EMJ15</td>
<td>Active degaussing width 150 mm,</td>
<td>400 V 50 Hz</td>
</tr>
<tr>
<td>EMJ30-2</td>
<td>Active degaussing width 300 mm,</td>
<td>400 V 50 Hz</td>
</tr>
<tr>
<td>EMJ50B</td>
<td>Active degaussing width 500 mm,</td>
<td><strong>power supply EG2422</strong></td>
</tr>
<tr>
<td>EMJ75-2B</td>
<td>Active degaussing width 750 mm,</td>
<td><strong>twin yoke, power supply EG2422</strong></td>
</tr>
</tbody>
</table>
Small Yokes

Small degaussing yokes are ideally suited for loose small parts or workshop tools (slide gauges, screwdrivers, etc.).

The watertight cast housing (with rubber feet) can be placed on a table, and be connected directly to the mains supply. The field lines enter and exit only from the top of the yoke so that the magnetic field at the sides decreases rapidly. Standard degaussing yokes have a degaussing width of 50 and 100 mm resp.

Power supply:
- 230 V/50 Hz
- 24 V/50 Hz (on demand)

<table>
<thead>
<tr>
<th>Type (Examples)</th>
<th>Active width mm</th>
<th>Depth mm (moving sense)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMJ05</td>
<td>50</td>
<td>160</td>
</tr>
<tr>
<td>EMJ10</td>
<td>100</td>
<td>255</td>
</tr>
</tbody>
</table>

Special Yokes

These customized special yokes are made to specifications, adapted to a workpiece or an existing transport system.

For specific applications or limited space solutions, we offer special sizes on demand.

Mini yoke for medical technology

Yoke with extra long pole shoes to reach the workpiece of an existing transport system

Degaussing inside of tubes
Yokes

High Performance Yokes

These degaussing yokes create an extremely strong magnetic field and are recommended for roller bearings, small parts in trays or grid baskets, etc.

The magnetic windings are sealed watertight-ly (IP55) and the active surface is closed with an exchangeable protection plate. Due to its weight, we recommend to always mount the yoke solidly to a degaussing line or frame construction. For this purpose, the yoke has threaded holes M 10. The standard degaussing widths are 150 mm – 1000 mm.

Power supply: • 400 V/50 Hz
• EG2422 (for „B“ series yokes)

<table>
<thead>
<tr>
<th>Type</th>
<th>Active width mm</th>
<th>Outer dimensions mm (W x H)</th>
<th>Depth mm (moving sense) without electrical pull box</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMJ15</td>
<td>150</td>
<td>260 x 127</td>
<td>280</td>
</tr>
<tr>
<td>EMJ20</td>
<td>200</td>
<td>310 x 127</td>
<td>280</td>
</tr>
<tr>
<td>EMJ25</td>
<td>250</td>
<td>360 x 127</td>
<td>280</td>
</tr>
<tr>
<td>EMJ30</td>
<td>300</td>
<td>410 x 127</td>
<td>280</td>
</tr>
<tr>
<td>EMJ35</td>
<td>350</td>
<td>460 x 127</td>
<td>280</td>
</tr>
<tr>
<td>EMJ40</td>
<td>400</td>
<td>510 x 127</td>
<td>280</td>
</tr>
<tr>
<td>EMJ45</td>
<td>450</td>
<td>560 x 127</td>
<td>280</td>
</tr>
<tr>
<td>EMJ50</td>
<td>500</td>
<td>610 x 127</td>
<td>280</td>
</tr>
<tr>
<td>EMJ55</td>
<td>550</td>
<td>660 x 127</td>
<td>280</td>
</tr>
<tr>
<td>EMJ60</td>
<td>600</td>
<td>710 x 127</td>
<td>280</td>
</tr>
<tr>
<td>EMJ65</td>
<td>650</td>
<td>760 x 127</td>
<td>280</td>
</tr>
<tr>
<td>EMJ70</td>
<td>700</td>
<td>810 x 127</td>
<td>280</td>
</tr>
<tr>
<td>EMJ75</td>
<td>750</td>
<td>860 x 127</td>
<td>280</td>
</tr>
<tr>
<td>EMJ80</td>
<td>800</td>
<td>910 x 127</td>
<td>280</td>
</tr>
<tr>
<td>EMJ85</td>
<td>850</td>
<td>960 x 127</td>
<td>280</td>
</tr>
<tr>
<td>EMJ90</td>
<td>900</td>
<td>1010 x 127</td>
<td>280</td>
</tr>
<tr>
<td>EMJ95</td>
<td>950</td>
<td>1060 x 127</td>
<td>280</td>
</tr>
<tr>
<td>EMJ100</td>
<td>1000</td>
<td>1110 x 127</td>
<td>280</td>
</tr>
</tbody>
</table>

Special dimensions on demand
**Functional Principle**

In order to assure lasting degaussing results, it is essential to use a strong magnetic field and to select the appropriate degaussing frequency.

In many cases, simply the standard line voltage of 50 / 60 Hz is used for degaussing. However, this is not enough to allow for thorough penetration in case of pieces with larger wall thickness. With increasing frequency and field strength, eddy currents tend to build up inside the materials which produce antagonizing fields and hence reduce or limit the penetration depth.

As a consequence, residual magnetic fields in the center of a workpiece will emerge to the surface so that, after a few days at the latest, the residual magnetism existing before the degaussing procedure will again be measurable.

For reliable degaussing of work pieces with wall thickness > 10 mm, especially in the case of very hard steels, we therefore recommend degaussing at lower frequencies.

The use of low frequency generators reduces the secondary eddy currents in the center of the work piece, enabling the necessary penetration depth.

Very solid work pieces as for example extrusion dies, railroad tracks, punching devices, large shafts and tubes require frequencies of less than 1 Hz to keep the workpiece magnetically neutral throughout.

Other reasons for utilizing low frequencies are metal product carriers, punched / perforated pallets or grid baskets which are creating eddy currents within the degaussing fields and thus produce antagonizing fields shielding the work piece.

We offer diverse electronic generators supplying low frequency.

**Control Software EG-Control**

**EG-Control**

EG-Control is a Windows based PC control software developed for our low frequency generators series EG24xx. This software allows comfortable settings as well as recall of memorized customized parameters for a specific work piece (for example field strength, frequency, symmetry, etc).

It is possible to store more than 1000 default settings which can be selected manually from a list or recalled with a bar code scanner (option), and be transferred via serial interface to the low frequency generator.
Low Frequency Generators

Low Frequency Generator EG2422

For type “B” degaussing coils, yokes and twin yokes.

The generator modifies the mains supply in a way that it supplies the requested power for the degaussing unit.

Possible settings
- Permanent or pulse degaussing
- Symmetry: +25 % to –25 %
- Current intensity: 50 % to 95 %

Power supply:
- 2 x 400 V 50 Hz
- Special voltages

The maximum current intensity depends on the connected degaussing system. The recommended protection ranges therefore from 40 A up to 63 A delay action fuse.

Dimensions (W x D x H): 56 x 48 x 20 cm

<table>
<thead>
<tr>
<th>Mains frequency</th>
<th>Degaussing frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 Hz</td>
<td>0.9 1.7 2.6 4.5 7.1 10.0 16.7 50.0</td>
</tr>
<tr>
<td>60 Hz</td>
<td>1.1 2.0 3.1 5.4 8.5 12.0 20.0 60.0</td>
</tr>
</tbody>
</table>

Low Frequency Generator EG2422S

Power supply for reinforced degaussing coils “C” series.

This generator has a higher output rating than the EG2422, as well as a bigger housing with heat exchanger for cooling.

Possible settings
- Permanent or pulse degaussing
- Symmetry: +25 % to –25 %
- Current intensity: 50 % to 95 %

Degaussing frequency: see table for EG2422

Power supply:
- 3 x 400 V 50 Hz
- Special voltages on demand
Recommended protection: 100 A delay fuse

Dimensions (W x D x H): 65 x 68 x 97 cm
Low Frequency Generators EG2440 and EG2450

Our top products for degaussing of large tubes, tubes bundles, gear boxes, bar steel, heavy bulk material, large bearings or other big parts of several tons.

These generators are connected to „A“ series degaussing coils enabling the creation of degaussing fields of more than 2000 A/cm*

The outstanding characteristic of these generators is their automatic adaptation of the degaussing frequency to the work piece size. The degaussing frequency goes down as low as approx. 0.5 Hz; this allows greater penetration depths into the material.

Technical Data

Possible settings
- Permanent or pulse degaussing
- Strength of degaussing current
- Symmetry of degaussing current

Power supply:
- 3 x 400 V ± 10 %, 50/60 Hz
- Recommended fuse protection: 63 to 80 A time-lag
- Ambient temperature: 0 °C - 55 °C

Max. coil current:
- EG2440 with 120 A
- EG2450 with 225 A

Degaussing frequency:
- typically 0.5 - 40 Hz*

Dimensions (W x D x H):
- EG2440: approx. 67 x 67 x 221 cm
- EG2450: approx. 123 x 67 x 221 cm

*depending on coil size and coil current
**Low Frequency Generator EG2422R**

Power supply for rotary field coils type EM06R to EM36R.

The generator modifies the mains supply in a way that it supplies the requested power for the degaussing unit.

Possible settings
Current intensity: 50 % to 95 %

<table>
<thead>
<tr>
<th>Mains frequency</th>
<th>Frequency of the rotary magnetic field</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 Hz</td>
<td>0.5 0.9 1.4 2.6 3.8 5.6 10.0 50.0</td>
</tr>
<tr>
<td>60 Hz</td>
<td>0.6 1.1 1.7 3.1 4.6 6.7 12.0 60.0</td>
</tr>
</tbody>
</table>

**Low Frequency Generator EG2422K**

Mobile Degaussing station for pulse degaussing of integrated or partly dismantled tools and machine parts resp.

Application:
Degaussing of pressing tools and components as stamps, matrixes, steel frames or parts of turning / milling machines as mounted jaw chucks, tailstocks, spindles, drive shafts and others.

Possible settings:
- Degaussing frequency 16.7 – 50 Hz
- Field strength depending on windings
- Symmetry +25 % to -25 %
- Current intensity 50 % to 90 %

Power supply:
- 2 x 400 V / 50 Hz
- Special voltages on demand
- Recommended fuse protection 16 A time-lag
- Degaussing cable length 5 m (others on demand)

Dimensions (W x D x H): 65 x 41 x 100 cm
Low Frequency Generator EG2422P

Power supply for pulse degaussing coils series VEM type „P“.

This generator allows, due to its special pulse technology, for achieving higher magnetic field strengths values, at short dwelling times of a work piece inside the coil.

The degaussing frequency can be adjusted in 5 steps. Owing to the short degaussing time, high clock rates are achieved, along with very low consumption rates at the same time. The EG2422P can be used as a simple stand-alone solution with manual operation as well as customized solution integrated in an existing automated production line.

Application:
Degaussing of tools and components or bulk goods made of especially hard steel alloys.

Degaussing of individual parts, in containers, on trays or product carrier, as for example machining tools made of tool-steel or cemented carbide, cutting tools, drills, milling tools, roller bearings, mounted or single, prior to assembly or cleaning, and any other components requiring very high magnetic fields for degaussing, due to their magnetically hard steel alloys.

<table>
<thead>
<tr>
<th>Mains frequency</th>
<th>Degaussing frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 Hz</td>
<td>4.5  7.1  10  16.7  50</td>
</tr>
<tr>
<td>60 Hz</td>
<td>5.4  8.5  12  20  30</td>
</tr>
</tbody>
</table>
**Complete Systems / Examples**

**Degaussing System Series EMS**

Example: for tubes, bars, shafts, length of up to 3.5 m, weight up to approx. 1000 kg

Solution:
- Low frequency generator EG2422S or EG2440
- Degaussing coil mounted on motor-driven carrier plate
- Support basin for the tube, bars, shafts

Characteristics:
- extra compact and space-saving line compared with roller tracks
- gentle processing of finished surfaces owing to static degaussing process

**Degaussing System Series EMS**

Example: for short semi-finished products, finished parts or packed goods on Euro pallets

Solution:
- Low frequency generator EG2440 or EG2450
- Degaussing coil on motor-driven carrier

Characteristics:
- degaussing of pre-packed work pieces
- very short preparation times
- easy loading by floor handling equipment
Complete Systems / Examples

Degaussing System Series EJT

Example: Degaussing of larger work pieces like roller bearings, anti-friction bearings, tools and finished products in baskets, product carriers or directly on feeding conveyor / roller tracks

Solution:
- degaussing twin yoke „B” series
- customized roller for baskets / product carriers
- conveyor between the two parts of the twin yoke
- with or without height adjustment for the upper yoke
- passage degaussing (continuous / single)

Characteristics:
- stand-alone solution or integrated in a production line
- particularly recommended for vertical parts in tray / carrier
- maximum passage height of approx. 400 mm
Degaussing System Series EJT

Example: Small work pieces like bearings, anti-friction bearings, tools, bolts, gears, etc.

Solution:
- Degaussing yoke EMJ15 / EMJ30, mounted under conveyor belt
- Conveyor belt with strips for smooth transport of small parts or bulk goods

Characteristics:
- max. height for parts or bulk goods of 30 mm
- well-suited for flat parts in tray or directly on conveyor
- for mobile or stationary application

Degaussing System Series EMJ

Example: Small single parts with manual feeding for tools, flat finished products and components

Solution:
- Degaussing yoke EMJ15 / EMJ20 / EMJ30 etc.
- manually operated moving slide

Characteristics:
- simple low-cost solution
- mounted on table or with base frame
- for parts heights up to 30 mm
Complete Systems / Examples

Degaussing System Series EMK

Example: for tubular springs, piston rings, thin open steel rings, open toothed rings and other ring-shaped finished parts made of steel

Solution:

- Low frequency generator EG2422R
- Rotary degaussing coil type EMxxR (60 x 60 mm up to 360 x 360 mm)
- Mechanic installation type EMK with centering device and chain drive

Characteristics:

- degaussing of the work piece packs in a packing unit
- best results owing to rotary magnetic field
- avoids creation of residual magnetic poles at the touching points of the individual rings
Degaussing System Series EMT

Example: high-performance degaussing line for single parts / bulk goods as for example springs, lathed parts, stamped parts and other finished steel products in transport containers or baskets. Available with one-track or multi-track flange roller conveyor as well as belt conveyor mounted at the degaussing coil. Customized execution of an infeed or take-off buffer station possible.

Solution:
● Low frequency generator EG2440
● Degaussing coil „A“ series
● mechanical construction with roller track for feeding and take-off
● degaussing in continuous operation or by impulse operation

Characteristics:
● Execution as stand-alone line or integrated in existing production process
● Best-suited for bulk goods and layered parts
● Impulse operation enabling higher field strengths
Gauss Meter

Field Strength Meter

Vallon Field Strength Meter VFM1

for measuring magnetic DC fields or magnetic flux density

- for workshop and production
- compact like a mobile phone
- rugged and shock proof
- automatic selection of measuring range
- measuring value display available in A/cm or Gauss
- large LCD display
- high accuracy
- ergonomic design
- calibration can be traced back to national standards

The handy and robust magnetic field meter is ideally suited for production when it comes to measuring constant magnetic fields or magnetic flux density. The compact device can easily be used at any place, without cables, immediately operational.

The clearly visible LCD display shows the measured value and polarity of the magnetic induction (B) in Gauss or the residual field strength (H) in A/cm. We recommend to check the field meter before each use against the calibrated reference test piece which is available as an option for measuring value 20 A/cm or 20 Gauss.

Technical Data

Measurement ranges for the Gauß range:

- Range I.  ± 20 G (2 mT), Resolution: 0.01 G
- Range II. ± 200 G (20 mT), Resolution: 0.1 G

Measurement range for the A/cm range:

- Range I.  ± 20 A/cm (2 mT), Resolution: 0.01 A/cm
- Range II. ± 200 A/cm (20 mT), Resolution: 0.1 A/cm

- Accuracy of measurement: ± 2% [25°C]
- Metering surface: 6 mm²
- Metering distance between contact surface and active Hall sensor: approx. 1 mm
- Battery life: approx. 35 hours
- Batteries 2 x 1.5 V type AAA
- Weight (incl. batteries): 105 g
Magnetic Work Pieces

Problems due to Magnetism in Practice

- Metal chips and swarf stick to the work piece.
- Sintering tools wear off faster.
- Down times for robots / automatic feeding systems due to parts sticking together.
- Magnetic field sensors are falsely activated.
- Measurement errors at highly sensitive measuring instruments.
- Faulty welding seams.
- Electron beam welding becomes impossible.
- Irregular thickness of layers at hard chromium plating or titanium nitride coatings.
- Edges breaking off during electric discharge wire cutting.

Causes

The causes for magnetization of work pieces are various. Often enough, they cannot easily be ascertained in practice. The main causes are artificial magnetic fields acting in direct vicinity of the work pieces. These magnetic fields can be of intended or unintended origin, as for example: magnetic transport, induction hardening, magnet gripper, magnet chuck devices and others. Mechanical vibrations and cold forming under the influence of those magnetic fields, or processing the work pieces in North / South direction reinforce or enhance the process of magnetization.
Degaussing

Principle

Inside a ferromagnetic crystal, a larger amount of atoms always has the same orientation. This area can be considered from the outside as a domain (Weiß domain); its volume ranges from 0.001 to 0.1 mm³. If several areas have the same orientation, a work piece is magnetic.

Degaussing is achieved by reversing the homogenous orientation of the Weiß domains and thus creating an extreme disorder with the effect that the magnetic impact of the different areas is neutralized.

In practice, mainly the following methods are used:

- The work piece is exposed to a strong alternating magnetic field, which is constantly reduced to zero.
- The work piece is lead through a strong alternating magnetic field, at a slow and constant speed.
- The work piece is heated to >800°C (exceeding Curie-point), and slowly cooled down in a neutral spot (which is exposed to the magnetic field of the earth only).

Since the degaussing effect of the alternating field is at its optimum only if it has the same orientation as the magnetic field of the work piece, divers methods of creating the degaussing field will be necessary (degaussing coils, degaussing yokes).
Degaussing