



CESTRION

DEMAGNETIZATION

TECHNOLOGY

Professionals in demagnetization



Professionals in demagnetization

The company Cestriom is specialized in the development and design of high tech industrial demagnetizing equipment for ferromagnetic steel. The offer is supplemented by the following services: demagnetization on site, troubleshooting and consulting in magnetic field technology.

Challenging customer requirements demande tailor-made solutions. We develop customized demagnetizing machines based on a modular program, own technologies and extensive expertise in the field.

We attach great importance to a systematic and knowledge based approach while developing solutions in the hard-to-reach topic of magnetism. The key performance parameters of our demagnetizing machines are simulated by using self developed calculation tools. Cestriom also performs technology tests with real parts to support the simulations. This approach offers maximum reliability in every application.

Long term experience in the widest range of applications and customer segments completes our know-how. We use our broad knowledge, a systematic approach and the high enthusiasm for the topic of demagnetization to solve your questions and challenges.

Cestriom was founded by grad. mechanical engineer ETH Marek Rohner as a technology and service company. The founder has a long term professional background in the field of demagnetization.

Cestriom is an innovative company that develops products in the core business of demagnetization and continuously improves its own product range.

Cestriom is a reliable partner who provides support for the delivered products and services.

1.

Offers products and services in the field of demagnetization

2.

Develops demagnetization technologies with unique selling features

3.

Troubleshooter in magnetic field technology

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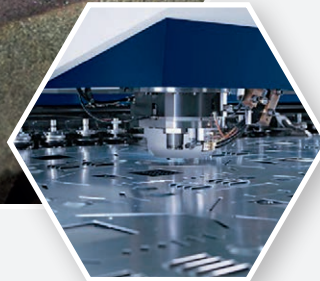
TECHNOLOGY



Where is magnetism produced in manufacturing environment?

Magnetization through mechanical manufacturing processes:

- Parts are being magnetized while machining/forming due to magnetic tools or clamping devices
- Machining uncovers magnetized areas deeply in the material
- Forming of steel may result in magnetization



Magnetization through handling and manipulation of parts:

- Lifting and workholding magnets magnetize ferromagnetic material
- Small area direct contact between parts and tools may lead to magnetization



Magnetization by magnetic, electrical and electrochemical processes:

- Strong electrical currents create significant magnetic fields and magnetize parts (e.g., welding, EDM ...)
- Magnetization by electrochemical processes with strong electric currents (e.g. electroplating)
- PVD coating processes with deliberately generated magnetic fields magnetize parts

Magnetization by storage and transport:

- Storage of large quantities of steel and small air gaps in between concentrate magnetic fields
- The orientation of the stored steel with respect to the surrounding magnetic field of earth may lead to magnetization
- Vibrations during transport may result in magnetization or demagnetization



Why demagnetizing?

→ Effects of magnetism and residual magnetism

Disturbing effects due to residual part magnetism in assembly and manufacturing processes:

- Impaired chip removal in machining processes. As a result, scratched surfaces or tool damage
- Adherence of stamping residues. Thereby damage to tools or damage of the produced parts
- Density problems with green parts in powder metallurgical processes
- Malfunctions during the assembly of sensitive products due to magnetically adhering particles
- Unstable welding and coating processes caused by magnetic deflection effects

Residual magnetism and cleaning (technical cleanliness):

- Residual magnetism causes attraction to ferromagnetic particles
- Cleaning processes: required cleanliness is not achieved reliably
- Under certain conditions cost saving potential due to demagnetization and thus reduced cleaning process effort
- Increased risk of malfunction in sensitive products caused by magnetic adhesion of particles

Effects caused by magnetism in measuring and testing processes:

- Pseudo effects in eddy current processes due to magnetic spots on surfaces
- Inaccurate readings of Hall or inductive sensors caused by uncontrolled magnetic fields
- Distraction effects in electron beam processes caused by uncontrolled magnetic fields
- Inaccurate readings in high-resolution measurements with fluxgate sensors in military and aerospace applications

Field strength surface	Chip adhesion (size)
2 ... 6 Gauss	200 ... 1'000 μm
6 ... 12 Gauss	1'000 ... 3'000 μm
12 ... 25 Gauss	larger than 3'000 μm
more than 25 Gauss	paper clip

Gaussmeter FM302:

- Suitable for measuring AC and DC magnetic fields
- Different probes available (range nT, μ T, mT, T)
- Units: Gauss, Tesla, A/m, Oersted
- Tangential probe AS-LTM: wear-resistant brass profile, measuring distance sensor <-> part surface: 0,7 mm
- Defined measuring distance of the probes (important for residual magnetism limit values)
- Fast sampling rate (up to 10 Hz)
- Maximum value memory
- Alternating field measurement (AC)
- Data evaluation via USB and software on the PC (see above right)
- Factory calibration included in set (We offer FM302 and accessories as a reseller)

*FM302 with
tangential probe
AS-LTM*



Measurement of magnetic fields with universal Gaussmeter FM302



*Software
(desktop
PC)*

Software:

- Connection FM302 via USB interface
- Operates on Windows PC
- Free choice of limit values
- Oscilloscope-like display of measured values
- Data logging with output to Excel
- Possibility to switch the meter parameters directly in the software

Purchase includes:

- Gaussmeter FM302
- Probe of your choice
- Software
- Calibration
- Suitcase





bs GRUPPE



FOERSTER



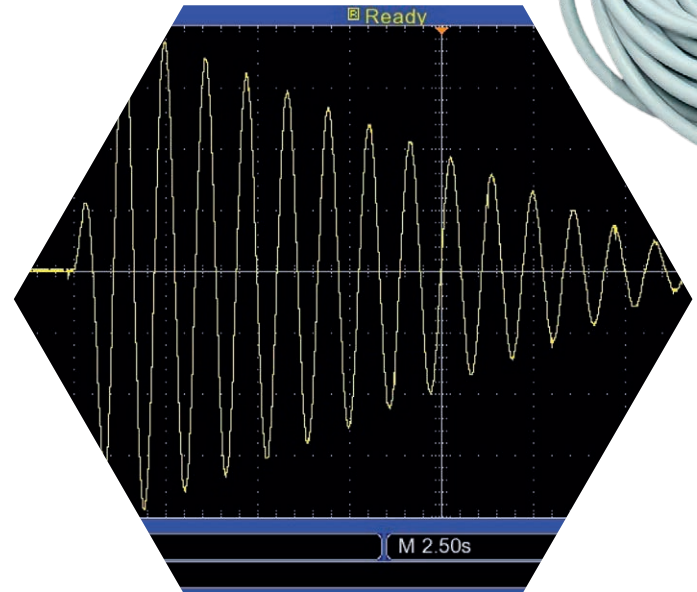
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Demagnetization: technologies and methods

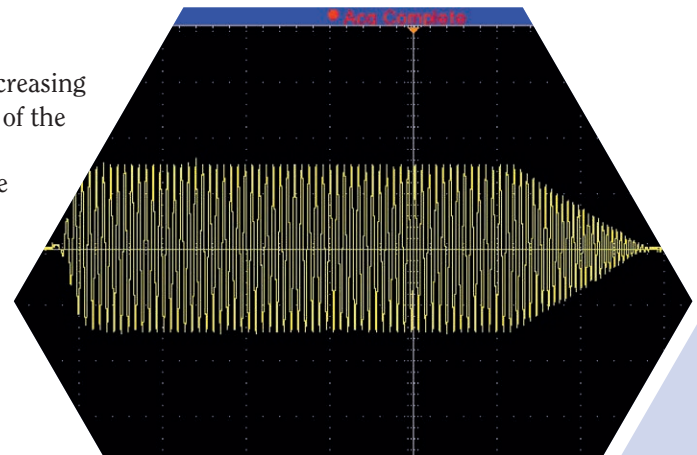
Pulse method:

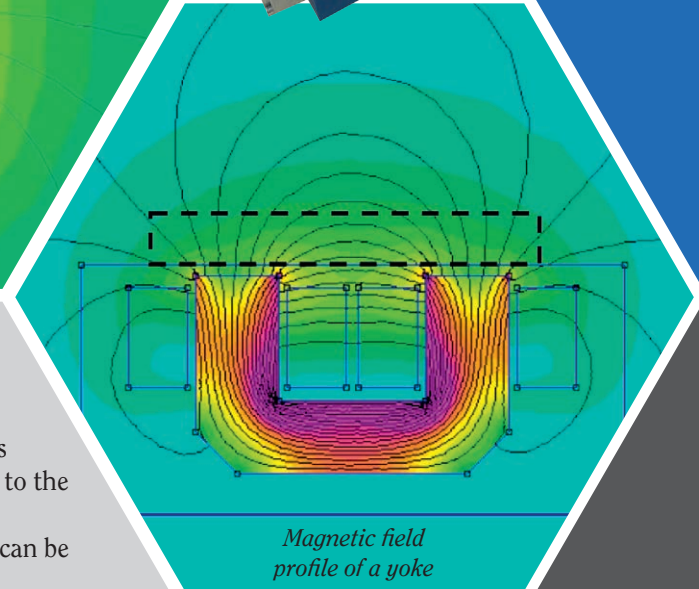
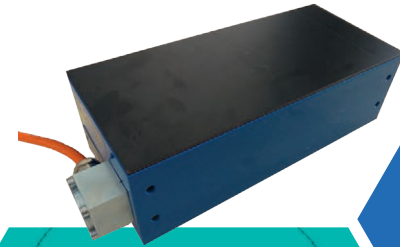
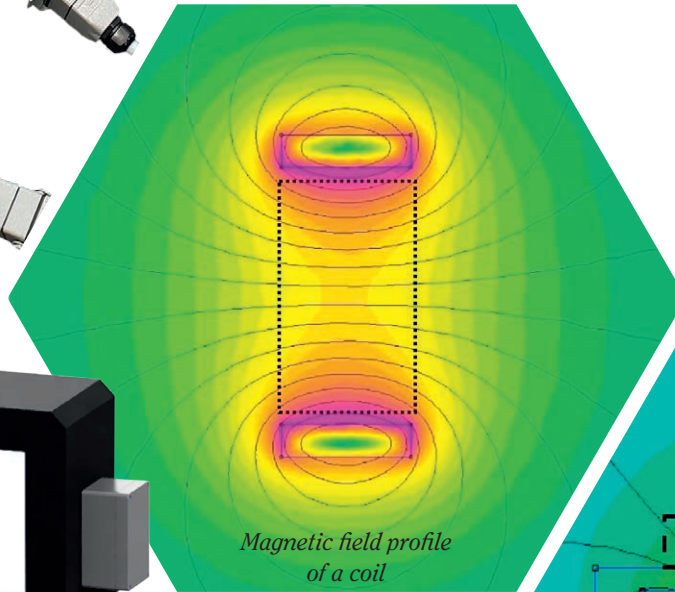
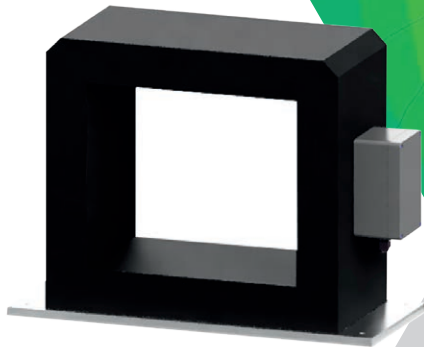
- The alternating magnetic field is briefly increased in the coil to a high amplitude and then reduced to zero
- Frequency, current, pulse shape and pulse duration are controlled by a power module
- The pulse parameters are optimally set for the application
- This technology provides best results



Continuous method:

- The alternating magnetic field remains constant in the coil
- The field reduction required for demagnetization is achieved by increasing the distance between the part and coil, e. g. by pulling the part out of the coil (or better by a conveyor belt)
- This method operates at lower field strength when compared to the pulse demagnetization
- Coil current is either generated by a power module or, in simple applications, provided directly from the mains





Coils:

- The alternating magnetic field is generated in a coil proportional to the supplied current
- Basically, a wide variety of coils can be used
- Tunnel coils and stray field coils are the most commonly used

Solutions from our own Development

Industrial demagnetizer

Standard power modules LM:

- 8 standard power modules (between 3 kVA ... 48 kVA) for generating the pulse currents
- Power needs: 200 ... 240 VAC or 380 ... 480 VAC, 50/60 Hz
- Simple control panel with lights and push buttons
- Optional text display for setting pulse parameters and accessing monitoring functions
- Exclusive use of standard components from leading electronics companies guarantees high availability
- 24 V interface for external control



LM14 ... LM20



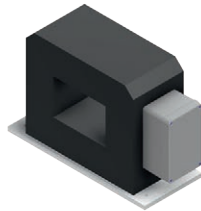
LM25 ... LM68



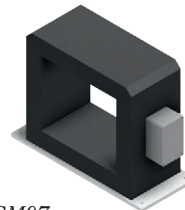
LM90 ... 120

SSM type coils:

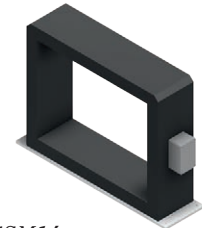
- 14 standard coils from $50 \times 50 \times 80$ mm to $710 \times 550 \times 210$ mm effective zone
- Optimally designed coils for high duty cycle at high field strength
- Monitoring of coil temperature by sensor
- Configurable for pulse or continuous demag. method
- Unique selling points (technology)
- Easy to integrate into automated or manual production



SSM03
Effective zone: $150 \times 100 \times 130$ mm



SSM07
Effective zone: $350 \times 300 \times 210$ mm



SSM14
*Effective zone:
 $710 \times 550 \times 210$ mm*

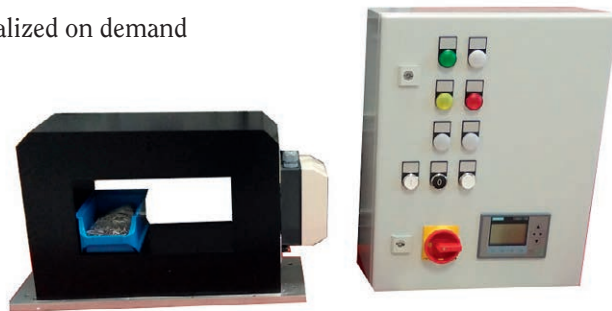
Tables

Coil (SSM)	Effective zone W × H × D [mm]	Exterior size W × H × D [mm]	Power module (LM)
SSM03	150 × 100 × 130	408 × 282 × 170	LM14 ... LM20
SSM04	250 × 250 × 160	510 × 405 × 200	LM14 ... LM47
SSM05	250 × 350 × 210	510 × 505 × 250	LM20 ... LM68
SSM06	260 × 130 × 145	520 × 315 × 185	LM14 ... LM47
SSM07	350 × 300 × 210	610 × 455 × 250	LM20 ... LM68
SSM08	350 × 450 × 210	610 × 605 × 250	LM25 ... LM68
SSM09	400 × 200 × 210	660 × 355 × 250	LM25 ... LM68
SSM10	400 × 400 × 210	660 × 555 × 250	LM25 ... LM90
SSM11	420 × 300 × 210	680 × 455 × 250	LM25 ... LM90
SSM12	550 × 550 × 210	810 × 705 × 250	LM38 ... LM120
SSM13	560 × 350 × 210	820 × 505 × 250	LM38 ... LM120
SSM14	710 × 550 × 210	970 × 705 × 250	LM38 ... LM120

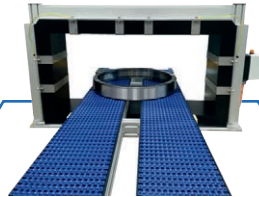
Special dimensions on demand

Power module (LM)	Power supply	Max. power [kVA]	Exterior size W × H × D [mm]
LM14	200 ... 240 VAC 50/60 Hz, 16 A	3,2	400 × 500 × 210
LM20	200 ... 240 VAC 50/60 Hz, 16 A	4,6	400 × 500 × 210
LM25	3 × 380 ... 480 VAC 50/60 Hz, 25 A	10,0	600 × 600 × 350
LM38	3 × 380 ... 480 VAC 50/60 Hz, 25 A	15,2	600 × 600 × 350
LM47	3 × 380 ... 480 VAC 50/60 Hz, 32 A	18,8	600 × 600 × 350
LM68	3 × 380 ... 480 VAC 50/60 Hz, 32 A	27,2	600 × 600 × 350
LM90	3 × 380 ... 480 VAC 50/60 Hz, 63 A	36	800 × 1000 × 400
LM120	3 × 380 ... 480 VAC 50/60 Hz, 63 A	48	800 × 1000 × 400

Larger power modules can be realized on demand



Controlled demagnetizer, special variants



*Coil: SSM-Sonder
Effective zone:
 $1000 \times 500 \times 270 \text{ mm}$*

*Coil: SSM-Sonder
Effective zone:
 $250 \times 250 \times 160 \text{ mm}$
air cooling*



SSM type coils:

- Double coil variants with deeper effective zone for overlapping part carriers, washing baskets or larger parts
- Coils with specific performance data and dimensions
- Field strengths over 200 kA/m (coil size dependent)
- Increased cooling by means of external heat sinks
- Other on request

Power module LM:

- Extended communication options (bus systems)
- Custom colors
- If required, increased cabinet cooling
- Installation of the power module components in customer-specific control cabinets
- process monitoring
- remote maintenance
- Other on request

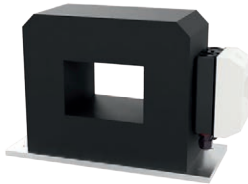
*Power module LM68
with cooling device*



*LM-Sonder
customer specific
variant*



Complementary products and technologies



Coil: DS03
Effective zone:
150 × 100 × 130 mm

Continuous demagnetizing:

- Typical use: continuous parts flow or single parts with small distance in between
- Easy to demagnetize, flat parts
- Power needs of the coils: mains with 50/60 Hz 230 VAC or 400 VAC
- Low investment cost

Magnetic field measurement with probe adapter:

- Probe adapter, probe and a PLC (or equivalent) make up the functioning measuring unit
- Use: automated measurement of magnetic fields of different types, process monitoring
- Project specific use



Probe adapter

PLC



Stray field demagnetizers:

- Stray field coils for continuous or pulse demag. (pulse method requires power module)
- Typical use: demagnetizing flat objects or small parts
- Project specific use

Demagnetizing with magnetic field cables

The demagnetizer MGFE is a mobile system for demagnetization of mostly larger components or entire machines. Flexible magnetic field cables are used as coil. The parts to be demagnetized are wrapped with the magnetic field cables-, or the magnetic field cable is wound into a coil and placed on the surfaces of the parts to be demagnetized.

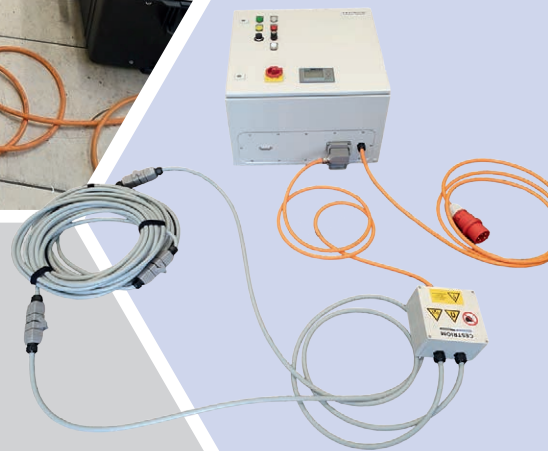
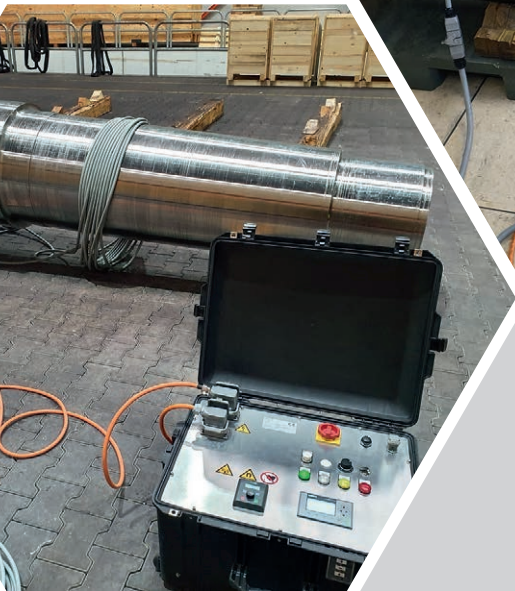
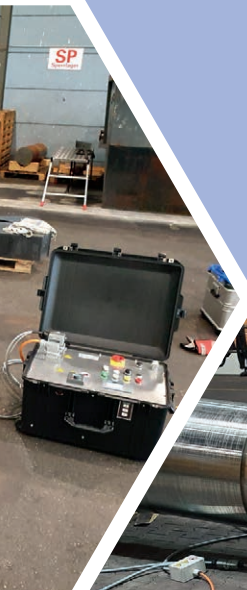
Difficult-to-reach places can usually be easily reached due to the flexibility of the magnetic field. The magnetic field cables can be coupled in order to increase the length and thus increase the number of turns and field strength.

Variant	Power supply	Max. power [kVA]	Dimension W × H × D [mm]	Weight [kg]
MGFE-30	200 ... 240 VAC, 50/60 Hz, 16 A	6,5	680 × 530 × 380	~ 23
MGFE-70	3 × 380 ... 480 VAC, 50/60 Hz, 32 A	27,2	680 × 530 × 380	~ 23

Magnetic field cables: different variants suitable for different applications

Special coils: coils of the SSM/DS series or customer-specific pulse coils can be realized

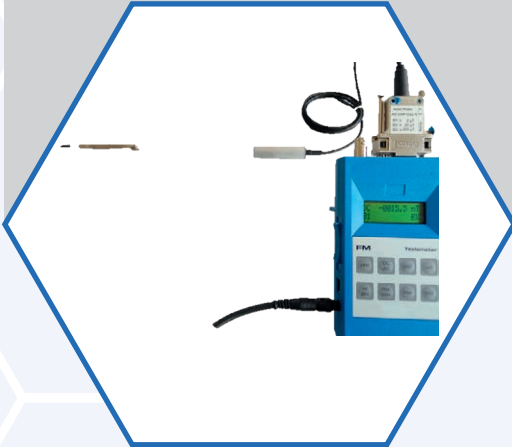




The combination
of power module LM68
and magnetic field
cables is an alternative
to the MGFE,
when low weight and
high mobility is less
important.

Magnetic field measurement:

- Measurement of components for residual magnetism
- Precise measurements down to nanoTeslas
- Measurement of magnetic moments for aerospace and military applications
- Analysis and interpretation of the results



Cestriom GmbH offers services in magnetic field technology



Demagnetization in-house and on site:

- Demagnetizing of components and machines on site with magnetic field device MGFE-70
- Demagnetization of parts at Cestriom
- Demagnetizer rental services



Training/consulting:

- Productive and safe use of demagnetizing machines
- Precise and reproducible measurement of residual magnetism on parts
- Avoiding magnetization in industrial production
- Optimum use of demagnetization methods, technologies, costs
- ...

Problem solving in magnetism:

- Analysis of magnetism induced product and/or process issues in industrial production
- Development of solutions to avoid such issues
- Knowledge-based approach supported by measurements, physical laws, calculation and



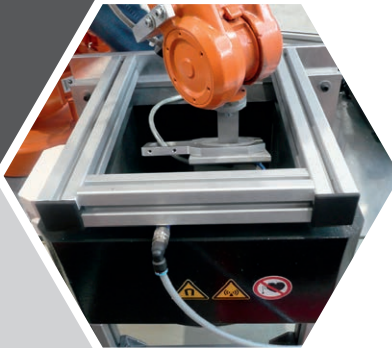
Examples

- Special machine for Tier-1 automotive customer
 - Demagnetizing after welding process
 - PLC control, ProfiNetcommunication
 - Process monitoring
 - Data transfer



- Demagnetizing before eddy current testing
 - 2 identical machines
 - End customer from wind power sector

- Demagnetizing before shot peening process
 - Continuous pulse demagnetization
 - Effective zone coil $W \times H$:
1'200 mm \times 125 mm
 - Automotive Tier-1



- Demagnetizer for Tier-1 automotive customer
 - Pulse duration only approx. 1'000 ms
 - Target: avoiding magnetic particle adhesion
 - Robot handling realized by third party



Do you have a challenge for us?

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