

# Cestriom GmbH – Professionals in demagnetization

The company Cestriom GmbH 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.

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 GmbH 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 GmbH was founded by grad. mechanical engineer ETH Marek Rohner as a technology and service company.

Before this event the founder has been working professionally in the field of demagnetization for many years. Cestriom GmbH is a reliable partner who provides support for the delivered products and services.

Our core business:

1. Providing demagnetizing machines, related services and solutions
2. Development of unique technological solutions
3. Troubleshooting in the field of industrial demagnetization

# Where is magnetism produced in manufacturing environment?

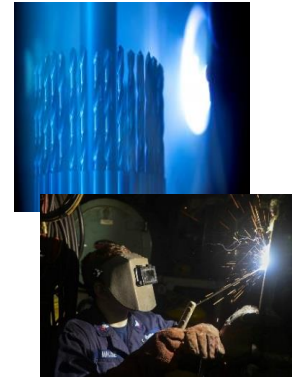
## Magnetization through mechanical manufacturing processes :

- 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 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 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 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...1'000µm
6...12 Gauss	1'000...3'000µm
12...25 Gauss	larger than 3'000µm
more than 25 Gauss	paper clip

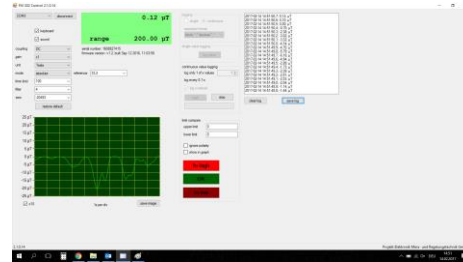
# Measurement of magnetic fields with universal Gaussmeter FM302

## Gaussmeter FM302:

- Suitable for measuring AC and DC magnetic fields
- Different probes available (range nT,  $\mu$ T, mT, T)
- Units: Gauss, Tesla, A/m, Oersted
- Tangential probe AS-LTM: wear-resistant brass profile, measuring distance sensor  $\leftrightarrow$  part surface: 0,7mm
- Defined measuring distance of the probes (important for residual magnetism limit values)
- Fast sampling rate (up to 10Hz)
- 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



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

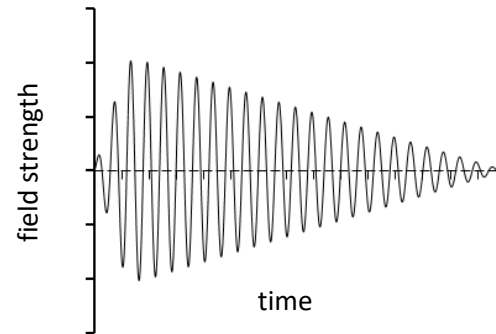
# Demagnetization: technologies and methods

## Pulse method :

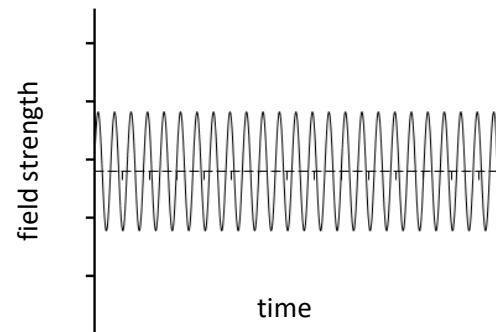
- The alternating magnetic field is briefly increased in the coil to a high amplitude and then reduced to zero
- Frequency, current, pulse shape and pulse duration are controlled by a power module
- The pulse parameters are optimally set for the application
- This technology provides best results

## 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

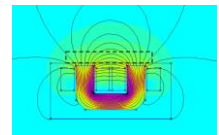
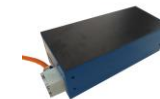
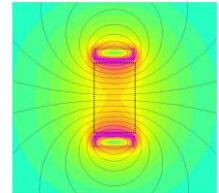
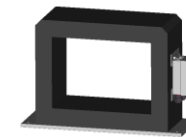


↑↑  
Magnetic field course of the coil



## 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

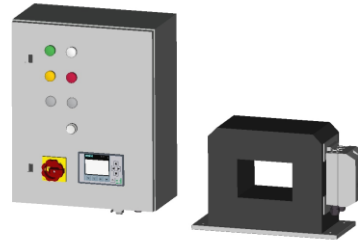


# Controlled demagnetizer

## Standard power modules LM :

- 6 standard power modules (between 3kVA...27kVA) for generating the pulse currents
- Power needs: 200...240VAC or 380...480VAC, 50/60Hz
- 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
- 24V interface for external control

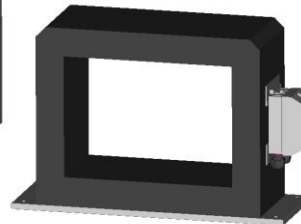
Power module: LM14



Coil: SSM03  
Effective zone:  
150x100x130mm



Power module: LM47



Coil: SSM11  
Effective zone:  
420x300x210mm

## SSM type coils :

- 14 standard coils from 50x50x80mm to 710x550x210mm 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



# Tables

Coil (SSM)	Effective zone WxHxD [mm]	Exterior size WxHxD [mm]	Power module (LM)
SSM03	150x100x130	408x282x170	LM14...LM20
SSM04	250x250x160	510x405x200	LM14...LM47
SSM05	250x350x210	510x505x250	LM20...LM68
SSM06	260x130x145	520x315x185	LM14...LM47
SSM07	350x300x210	610x455x250	LM20...LM68
SSM08	350x450x210	610x605x250	LM25...LM68
SSM09	400x200x210	660x355x250	LM25...LM68
SSM10	400x400x210	660x555x250	LM25...LM68
SSM11	420x300x210	680x455x250	LM25...LM68
SSM12	550x550x210	810x705x250	LM38...LM68
SSM13	560x350x210	820x505x250	LM38...LM68
SSM14	710x550x210	970x705x250	LM38...LM68

Power module (LM)	Power supply	Max. power [kVA]	Exterior size WxHxD [mm]
LM14	200...240VAC 50/60Hz, 16A	3,2	400x500x210
LM20	200...240VAC 50/60Hz, 16A	4,6	400x500x210
LM25	3x380...480VAC 50/60Hz, 25A	10,0	600x600x350
LM38	3x380...480VAC 50/60Hz, 25A	15,2	600x600x350
LM47	3x380...480VAC 50/60Hz, 32A	18,8	600x600x350
LM68	3x380...480VAC 50/60Hz, 32A	27,2	600x600x350

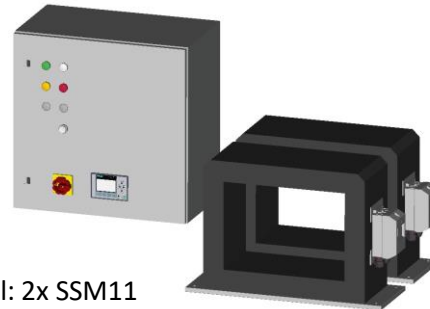


# Controlled demagnetizer, special variants

## 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

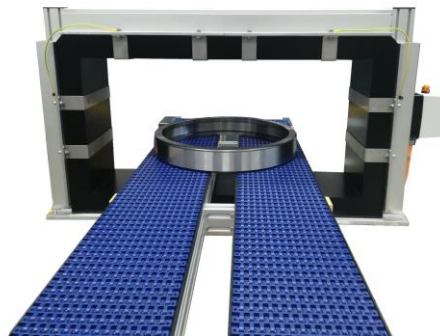
Power module: LM68



Coil: 2x SSM11  
Effective zone WxHxD:  
420x300x500mm

## 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 200kA/m (coil size dependent)
- Increased cooling by means of external heat sinks
- Other on request



Coil: SSM-Sonder  
Effective zone: 1000x500x270mm

Power module: LM68

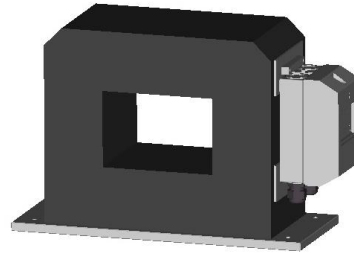




# Complementary products and technologies

## 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 50/60Hz 230VAC or 400VAC
- Low investment cost



Coil: DS03  
Effective zone:  
150x100x130mm



## 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



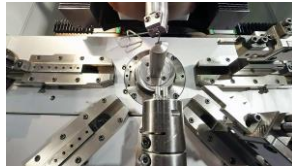
## Magnetic field measurement with probe adapter :

- 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

# 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 GmbH



## 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
- ...



## 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



## Problem solving in magnetism :

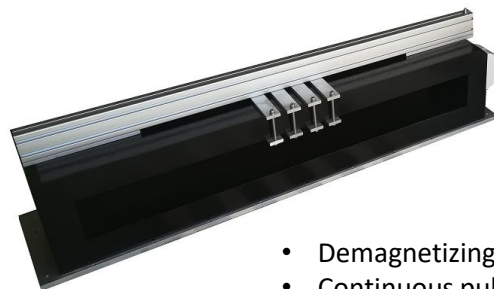
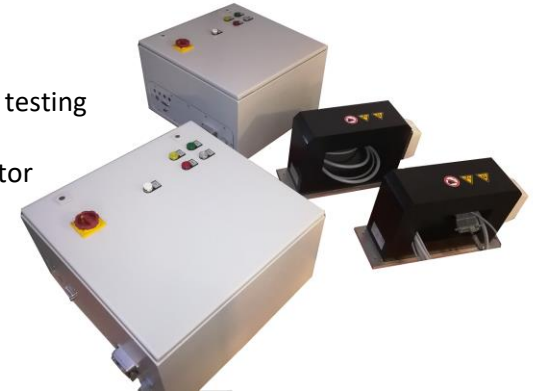
- Analysis of magnetism induced product and/or process issues in industrial production
- Development of solutions to avoid such issues
- Knowledge-based approach supported by measurements, physical laws, calculation and experience

# Examples



- Special machine for Tier-1 automotive customer
- Demagnetizing after welding process
- PLC control, ProfiNet communication
- 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 WxH: 1'200mm x 125mm
- Automotive Tier-1



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

Do you have a challenge for us?

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