



MAGNETOM Sola

Environmental Product Declaration



Embrace Human Nature at 1.5T

MRI needs to provide high-quality results – cost-effectively and consistently. Therefore, it needs to better handle patient variability, to deliver robust results for all patients and in every scan.

MAGNETOM Sola¹, the first 1.5T system with BioMatrix technology, turns challenges into opportunities, delivering a whole new level of consistency, efficiency and new clinical capabilities.

Key Product Features

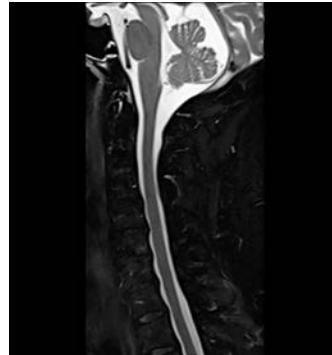
- BioMatrix Technology for less rescans and consistent, high quality personalized exams
- New 1.5T magnet, 70 cm Open Bore and large 50 x 50 x 50 cm³ FoV
- Free-breathing exams with Compressed Sensing for higher patient comfort
- Push-button exams and GO technologies powered by AI technology for increased patient throughput
- New accelerated applications with Simultaneous Multi-Slice reducing scan time by up to 46% for comprehensive MSK exams²

MAGNETOM Sola¹

Key Differentiator

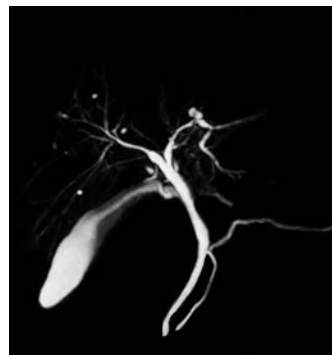
MAGNETOM Sola is the first 1.5T MRI system with BioMatrix Technology, delivering consistency and efficiency in daily clinical routine. The user-friendly work environment and GO technologies enable push-button examinations and help to accelerate the entire workflow from patient positioning to result distribution. Artificial intelligence based technologies support in automating routine tasks, for robust and consistent workflows, even in a high volume environment. New speed technologies such as Simultaneous Multi-Slice TSE can dramatically reduce scan times for routine examinations. Furthermore, MAGNETOM Sola with its wide 70 cm Open Bore also expands the patient population eligible for MRI, with free-breathing Compressed Sensing applications.

MAGNETOM Sola incorporates several power-saving technologies reducing the energy consumption significantly over comparable systems. Additionally, with the Green Cooling Package (optional), customers can decrease their energy consumption for cooling by up to 39%³. Furthermore, MAGNETOM Sola is easy to site with low space requirements and low connection values enabling to use existing infrastructures and with that reduce installation costs.



Zero Helium Boil-off Magnet Technology

MAGNETOM Sola uses a superconducting magnet. During operation, the magnet windings must be cooled below their critical temperature. That happens with liquid helium. Equipped with a Zero Helium boil-off technology, MAGNETOM Sola requires no helium refill in normal use. This saves costs while maintaining a stable system performance.



Environmental Benefits

- Reduction of energy consumption with Eco-Power technology
- State-of-the-art Zero Helium boil-off technology
- Green Cooling Package (optional) with automatic adaption to cooling requirements to decrease energy consumption for cooling by up to 39%³

Customer Benefits

- Consistent high image quality with BioMatrix Technology
 - Reduced life-cycle costs by increased energy efficiency
 - Small installation area enabled by ultra-short and lightweight magnet technology
 - Increased marketability and accomodation of more patients thanks to excellent patient comfort options and free-breathing exams with Compressed Sensing
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Environmental Management System

Siemens Healthineers gives high priority to achieving excellence in Environmental Protection, Health Management and Safety (EHS).

Across the globe, Siemens Healthineers has implemented a consistent EHS management system. It lays the foundation for the continuous improvement of our performance in these areas, and regular auditing assures our conformance.

As a result of this consistent approach, the entire Healthcare Sector is considered as one organization and is certified in accordance with ISO 14001 and OHSAS 18001.

Environmental Product Design



Material supply:
From natural resources to delivery of semi-finished products



Production/delivery:
From production of components to operation startup by the customer



Use/maintenance:
Includes daily use by our customers as well as maintenance



End of life:
From disassembly at the customer through material and energy recycling

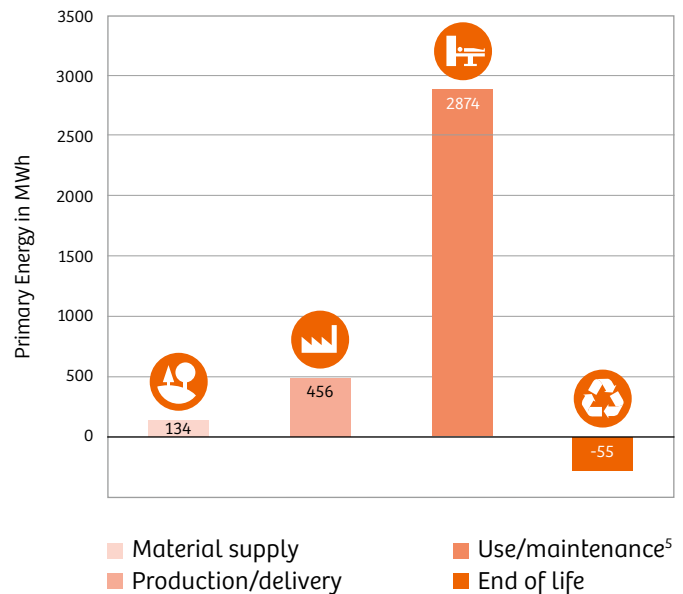
Siemens Healthineers considers environmental aspects in all phases of the product life cycle, including material supply, production/delivery, use/maintenance and end of life.

Our product design procedure fulfills the requirements of IEC60601-1-9:2007 "Environmental product design for medical electrical equipment".

This standard supports the effort to improve the environmental performance of our products.

Cumulative Energy Demand

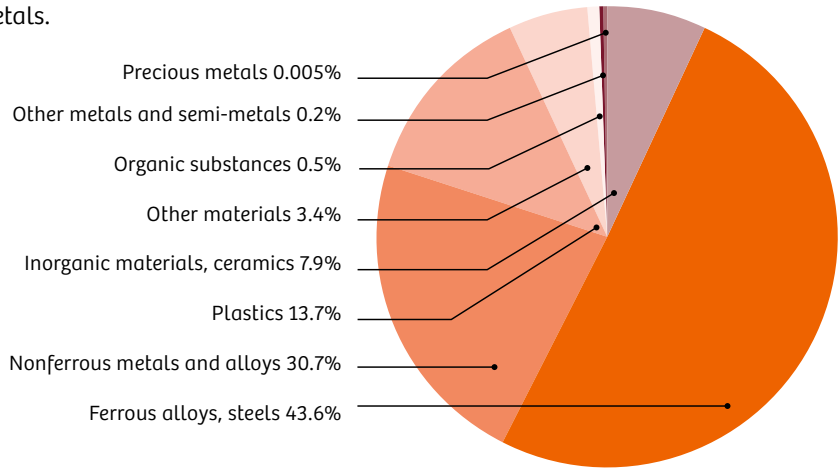
Energy consumption is the most important environmental characteristic of medical devices. This is why we use Cumulative Energy Demand to assess environmental performance. Cumulative Energy Demand is the total primary energy⁴ that is necessary to produce, use and dispose of a device – including all transportation. Our medical devices can be recycled almost completely for materials or energy. With an appropriate end-of-life treatment it is possible to return up to 55 MWh in form of secondary raw materials or thermal energy to the economic cycle.



Product Materials

MAGNETOM Sola is mainly built out of metals. This ensures a high degree of recyclability.

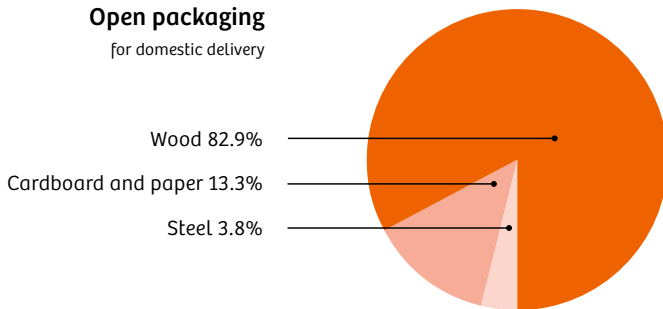
Total weight: approx. 6,500 kg



Packaging Materials

Open packaging

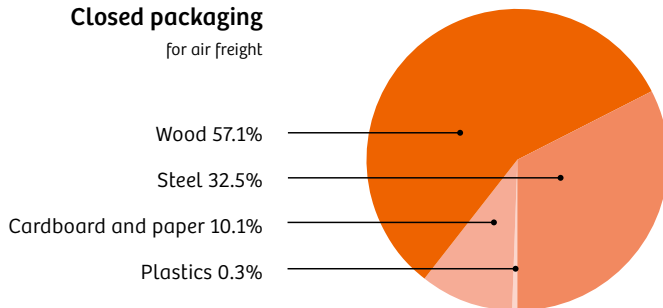
for domestic delivery



For domestic delivery our MRI systems are transported by truck in open packaging. For overseas delivery by air freight closed packaging is used and the magnet is delivered on a reusable steel pallet (see graphs on the right). In case of sea freight the components are additionally vacuum packed.

Closed packaging

for air freight



The packaging reuse ratio for closed packaging is more than 50%. The rest is supplied to material recycling. Only an insignificant amount (~ 1%) has to be recycled for energy.

Total weight:

- open packaging approx. 365 kg
- closed packaging approx. 1,600 kg

Product Take Back

Most of the materials used to produce MAGNETOM Sola are recyclable. 92% (by weight) can be recycled for material content and 8% for energy.

Our product take back program ensures that we address the environmental aspects of our products – even at the end of life. As part of this program, we refurbish systems

and reuse components and replacement parts whenever possible through our Refurbished Systems business.

We reuse components and subsystems for non-medical products. We also recycle for material or energy value. Disassembly instructions for disposal and recycling are available for our products.



Operating Data

Heat emissions of the device ⁶	
• System ready to measure ⁷	8.2 kW (XJ gradients) ⁹ 8.7 kW (XQ gradients)
• Scan ⁸	20.2 kW (XJ gradients) ⁹ 22.7 kW (XQ gradients)
Allowed ambient temperature ⁸	18°C–22°C
Allowed relative humidity ¹⁰	40–60%
Noise level	
• Basic load	≤ 59.0 dB (A) ¹¹
• Full load	≤ 101.8 dB (A) ¹¹
Power consumption ⁶	
• System off	4.3 kW
• System ready to measure ⁷	8.2 kW (XJ gradients) ⁹ 8.7 kW (XQ gradients)
• Scan ⁸	20.2 kW (XJ gradients) ⁹ 22.7 kW (XQ gradients)
Power-on time ¹²	5.5 min
Power-off time ¹²	5.5 min

Technical Specifications

Interface for heat recovery	No
Possible type of cooling	Water-Cooling Air-Cooling
Complete switch-off is possible	No
Device is adjustable for the user in terms of height	Not applicable
Uniform operating symbols for device families	Yes

Radiation

Measures/techniques to minimize ionizing radiation exposure	Not applicable
Minimization of ionizing radiation compared to the limit value for patients	Not applicable

Electromagnetic Fields

Measures/techniques to minimize the exposure to electromagnetic fields	<ul style="list-style-type: none"> • actively shielded magnet • actively shielded gradients • if necessary magnetic shielding RF-cabin with 90 dB damping
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Replacement Parts and Consumables

Item	Life cycle ¹³
Rechargeable battery (mobile table)	3 years
Cold head	2 years
ECG-Electrodes	Disposable material

Disposal/Substance Information

End of life concept	Yes
Recycling information	Yes
List of hazardous substances	Yes

Cleaning

The following classes of active agents in specific concentrations have been tested and are approved for cleaning:

The list is the smallest intersection of cleaning substances for the system and components.

- Aldehydes
- Quaternary compounds
- Guanidine derivatives
- Peroxide compounds
- Pyridine derivatives
- Chloro derivatives
- Commercially available cleaning agents, detergent substances

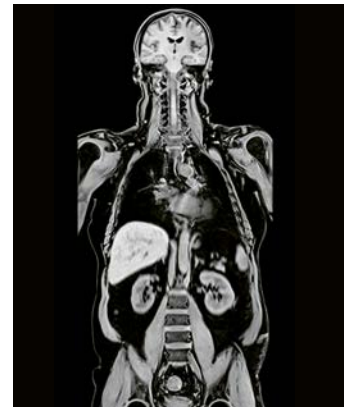
Suitability of the device for sterile areas	No
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Please refer to the dedicated operator manuals for system and components for a detailed list of approved and not approved cleaning substances and further instructions.

Further Ecologically Relevant Information

Elements of instruction are:

- Recommendations for saving energy Yes
- Recommendations for efficient cleaning Yes
- Recommendations for appropriate use of consumables Yes



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- 1 *MAGNETOM Sola is 510(k) pending. The scanner is not commercially available in all countries. Due to regulatory reasons the future availability cannot be guaranteed.*
- 2 *Data on file*
- 3 *Based on climate dates for Munich. Data on file; results may vary*
- 4 *Primary energy is the energy contained in natural resources prior to undergoing any man made conversions (e.g. oil, solar)*
- 5 *Based on 10 years usage*
- 6 *All values are typical values, applicable for 400V/50Hz. The power consumption described herein is based on results that were achieved in a setting according to the COCIR methodology MRI - Measurement of the energy consumption (<http://www.cocir.org/site/index.php?id=46>). Since many variables impact power consumption (e.g. sequences used for scanning and sequence parameters, scan time), there can be no guarantee that each customer will achieve the same values*
- 7 *Device is in operation but no patient examination takes place*
- 8 *Average value for energy consumption at examination of patients*
- 9 *The products/features (here mentioned) are not commercially available in some countries and not available for sale in the U.S.. Due to regulatory reasons their future availability cannot be guaranteed. Please contact your local Siemens organization for further details.*
- 10 *Within examination room*
- 11 *Measured according to NEMA in magnet room*
- 12 *From off-mode to operating state*
- 13 *Recommended exchange interval*

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