MAGNETOM Avanto Fit Upgrade with BioMatrix

Environmental Product Declaration

siemens-healthineers.com/avanto-fit

SIEMENS Healthineers

Embrace human nature

With an upgrade of an existing 1.5T MAGNETOM Avanto to MAGNETOM Avanto Fit with BioMatrix Technology, one can master the challenges facing MRI today, helping to expand MRI services and make the most of the initial investment. The outcome: fewer rescans, more predictable scheduling and consistent, high-quality personalized exams with increased productivity as well as new clinical, capabilities as well as new financial opportunities.

Make the most of your initial investment and upgrade to MAGNETOM Avanto Fit.

Key product features

- More robust and consistent results with patient-adpative BioMatrix Technology and intelligent guidance through myExam Companion
- Improved diagnostic quality with better image quality from high-density coils and new clinical applications
- Increased productivity with up to 50%[1] shorter exams through Turbo Suite
- Meeting financial targets by capitalizing on initial investment with up to 45%[1] savings compared to a new system and a significant lifetime prolongation and a reduced total-cost-of-ownership

Environmental benefits

- Significant MRI lifetime extension by upgrading to innovative new technology instead of replacing system
- Resource savings due to re-use of existing components like magnet
- Reduction of energy consumption with Eco-Power technology

Customer benefits

- Better image quality, new clinical possibilities and more robust and consistent MRI results with an upgrade to a BioMatrix System
- Reduced life-cycle costs with up to 30%[1] reduction in energy consumption after upgrade
- Short installation of only 15 days and no rebuilding costs

[1] *Data on file*

MAGNETOM Avanto Fit

Key differentiator

Being at the core of clinical routine, a 1.5T MR system has to provide fast and reliable results – for every patient, every time. The upgrade to MAGNETOM Avanto Fit achieves a new level of consistency and robustness with BioMatrix Technology. It makes fast and high-quality push-button examinations a clinical reality.

With Turbo Suite complete exams can be accelerated by up to 50%[2]. GO Technologies help to streamline the entire workflow from patient positioning to result distribution, powered by artificial intelligence. Additionally, MAGNETOM Avanto Fit, grants more patients access to MRI with free-breathing examinations as well as innovative new applications.

Overall, an upgrade to MAGNETOM Avanto Fit opens up new financial opportunities. By leveraging its efficiency and new clinical opportunities while at the same time reducing the total-cost-of-ownership of the system.

With Eco Power, a more cost-efficient energy management system, daily energy consumption can be reduced by up to 30%[2]. MAGNETOM Avanto Fit is a complete system renewal in a very short installation time of 15 days[3] at no rebuilding costs.

See how few steps it takes to upgrade MAGNETOM Avanto to MAGNETOM Avanto Fit

Upgrade your system in up to 15 working days

1. Magnet room

The body coil is removed and replaced with a new one.

2. New RF design

Installation of new DirectRF (RF all-digital transmit and receive components) directly at the magnet.

3. New covers

All covers are removed and replaced by new ones with two BioMatrix Interfaces Select&GO.

4. New BioMatrix and Tim 4G technology

New BioMatrix and Tim 4G technology, e.g., new BioMatrix table and Spine 32 coil including Repiratory Sensors, Head/Neck 20 with DirectConnect.

5. Technical room

Control and cooling unit cabinets are removed and replaced with new ones. New efficient energy management system installed.

6. Operator's room

All workstations, monitors, and keyboards are removed and replaced by new ones.

7. Licenses

Installed licenses are migrated into new *syngo* MR XA software platform and myExam Companion.

8. Hand over

After installation and image quality test, a comprehensive application training is held to help you get the best out of the new system.

[2] *Data on file*
[3] *Depending on system configuration and installation environment 2-3 additional days might be required*

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, Siemens Healthineers is considered one organization and is certified in accordance with ISO 14001 and ISO 45001.

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 site, 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 IEC 60601-1-9:2007 + A1 2013 Medical electrical equipment Part 1-9: General requirements for basic safety and essential performance – Collateral Standard: Requirements for environmentally conscious design.

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

Sustainability

Sustainability has always been a guiding principle for our company. Drawing on our extensive history, we pioneer breakthroughs in healthcare. For everyone. Everywhere. Doing this sustainably we are aligned with the United Nations' aim of improving living conditions for all, documented in the 17 Sustainable Development Goals. All our employees contribute to this aspiration.

More information on our commitment to sustainability are available under:

siemens-healthineers.com/company/sustainability

Siemens Healthineers focuses on four main areas:

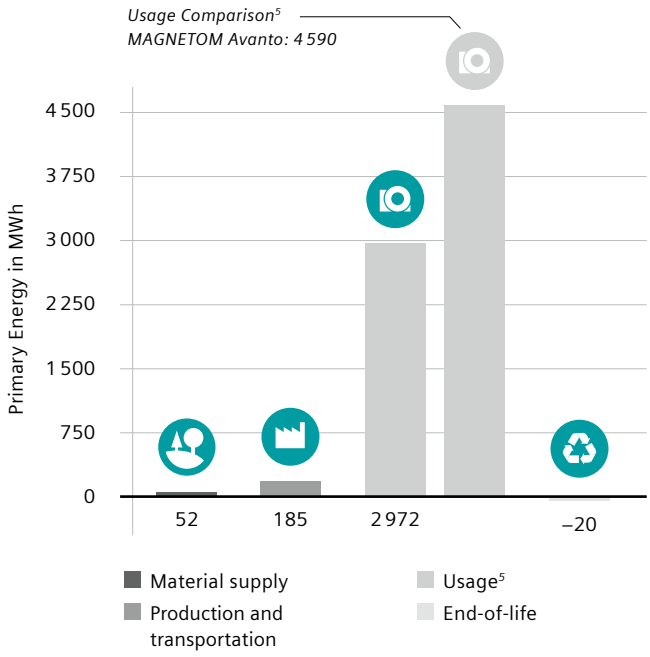
- Improve quality of life through access to healthcare and innovation
- Contribute to a regenerative and healthy environment
- Advance diversity and inclusion and drive employee engagement
- Create sustainable value through responsible business and leadership

For developing and placing on the market the following environmentally related standards and laws were taken into account:

- ISO 14001:2015 (Environmental management system)
- ISO 45001:2018 (Occupational health and safety management system)
- IEC 60601-1-9:2007+A1:2013 (Environmental product design for medical electrical equipment)
- RoHS Directive 2011/65/EU (Restriction of the use of certain hazardous substances in electrical and electronic equipment)
- REACH Regulation EC 1907/2006 (Registration, Evaluation, Authorisation and Restriction of Chemicals)
- California Prop 65 (California Safe Drinking Water and Toxic Enforcement Act of 1986)
- IEC 62474:2018 (Material Declaration for Products of and for the Electrotechnical Industry)
- IPC 1752A (Materials Declaration Management)
- IEC63000:2018 (Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances)
- Ecodesign Directive (2009/125/EC)

Cumulative energy demand

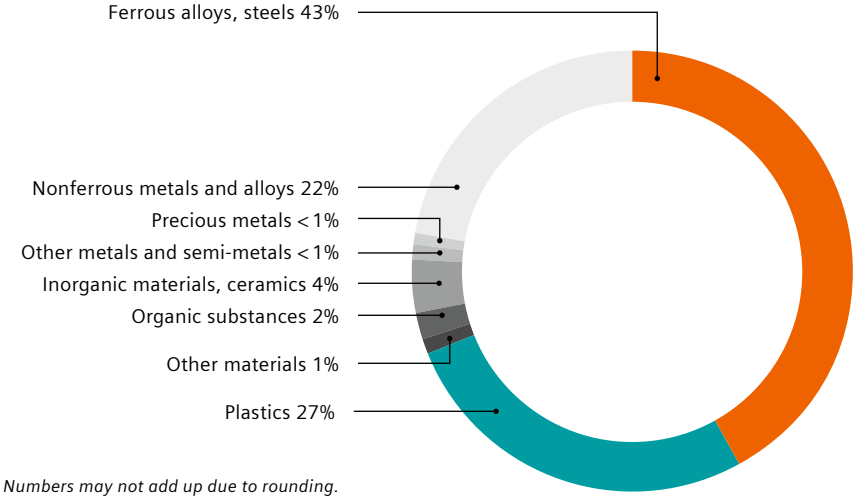
Energy consumption is the most important environmental characteristic of medical devices. This is why we use the Cumulative Energy Demand to assess environmental performance. Cumulative Energy Demand is the total primary energy[4] that is necessary to produce, use and dispose of the upgrade kits – including all upgrade material and transportation. The energy demand for usage is the cumulative demand after upgrading to MAGNETOM Avanto Fit and shows a reduction compared to original MAGNETOM Avanto system. 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 20 MWh of the upgrade kit in the form of secondary raw materials or thermal energy to the economic cycle.



Product materials

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

Total weight: approx. 2567 kg



Numbers may not add up due to rounding.

[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*

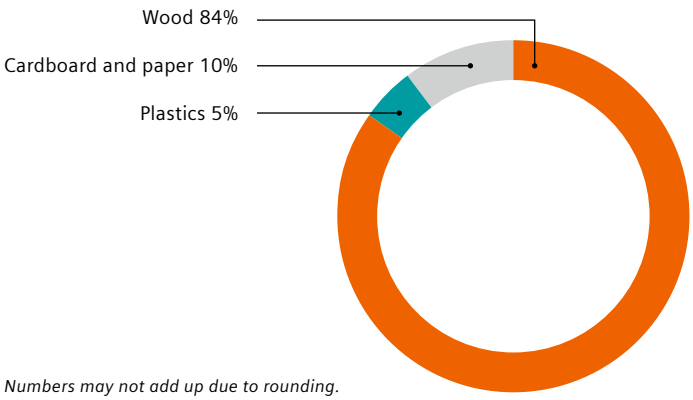
Packaging materials

It is our goal to minimize our packaging material and reduce the packaging waste by reusing and recycling it.

The upgrade components are transported as air-freight or by truck in open packaging for domestic delivery.

The values shown on the chart are average values of these kinds of packaging.

Total weight:
Open packaging: approx. 1164 kg



Numbers may not add up due to rounding.

Product take back

Most of the materials used to produce the MAGNETOM Avanto Fit upgrade are recyclable. 87% (by weight) can be recycled for material content and 13% 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.

Disassembly instructions for disposal and recycling are available for our products.

Operating data

Heat emissions of the device[6]	
• System ready to measure[7]	9.5 kW
• Scan[8]	20.6 kW
Allowed ambient temperature[9]	18°C–22°C
Allowed relative humidity[9]	40–60%
Noise level	
• Basic load	≤ 60.0 dB (A)
• Full load	≤ 99.0 dB (A)[10]
Power consumption[6]	
• System off[11]	4.4 kW
• System ready to measure[7]	9.5 kW
• Scan[8]	20.6 kW
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	Standard: water-cooling Optional: 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

Electromagnetic fields

Measures/techniques to minimize the exposure to electromagnetic fields	• Actively shielded magnet • Actively shielded gradients • If necessary magnetic shielding • RF-cabin with 90 dB damping

[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. Consumption of optional separator pump not included. Off value with Eco-Power Mode (EPM) active.

[7] Device is in operation but no patient examination takes place

[8] Average value for energy consumption at examination of patients

[9] Within examination room

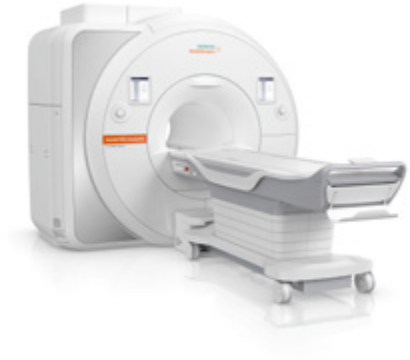
[10] Measured according to NEMA in magnet room

[11] Under usage of the Eco-Power Modus (EPM)

[12] Minimum values

Replacement parts and consumables

Item	Life cycle[13]
• Cold head	2 years
• Cold head (with SRS)	4.5 years
• Rechargeable battery (e-drive table)	3 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	• Aldehydes • Guanidine derivatives • Peroxide compounds • Pyridine derivatives • Chloro derivatives • Commercially available cleaning agents, detergent substances
Suitability of device for sterile areas	No
Size of the surface to be cleaned[14]	Approx. 9 m^2

Please refer to the dedicated user 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 instructions are:	
• Recommendations for saving energy	Yes
• Recommendations for efficient cleaning	Yes
• Recommendations for appropriate use of consumables	Yes

[13] *Condition Based Maintenance optional, exchange at a later stage is possible*
[14] *Front cover, front funnel, body coil, patient table overlay, local coil, control elements*

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The information in this document contains general technical descriptions of specifications and options as well as standard and optional features which may not always be present in individual cases.

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The statements by Siemens Healthineers' customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption) the results shown in this brochure are not a guarantee that other customers will achieve the same results.

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Siemens Healthineers Headquarters
Siemens Healthcare GmbH
Henkestr. 127
91052 Erlangen, Germany
Phone: +49 9131 84-0
siemens-healthineers.com

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