SIEMENS

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MAGNETOM Avanto^{fit}

Environmental Product Declaration

Answers for life.

MAGNETOM Avanto^{fit}

The landmark in 1.5T imaging.

MAGNETOM® Avanto^{fit}, equipped with Tim 4G and Dot, is the landmark in 1.5T imaging that will fundamentally transform the way you work with MRI. Through the integration of groundbreaking Tim® 4G (Total imaging matrix) and Dot® (Day optimizing throughput), MAGNETOM Avanto^{fit} sets a new standard of efficiency, ease-of-use, and care, which will help harness a new level of productivity. The increased productivity enables higher patient throughput and optimized workflow, ultimately increasing the number of examinations that can be done with one system and thereby, increasing the energy efficiency.

With AudioComfort, acoustic noise is reduced by up to 30 dB (A) as compared to conventional systems. This corresponds to a 97% reduction in noise level. So MAGNETOM Avanto^{fit} is one of the most efficient and low-noise universal 1.5T high performance systems. Almost all clinical applications operate below a noise level of 99 dB (A). This eliminates the mandatory requirement of ear protection for patients. We recommend, however, that headphones or ear plugs are worn at all times during highly sophisticated applications as well as by children or the elderly. Patient comfort increased considerably as compared to previous systems. In the course of 8 hours, the average noise level in the examination room is considerably less than 85 dB (A). As a result, personnel and accompanying persons are able to remain in the examination room without ear protection.

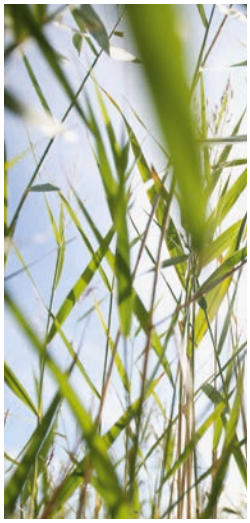
MAGNETOM Avanto^{fit} also has low operational costs and is easy to site. There is no need for a large, dedicated computer room, because Tim 4G's digital-in and digital-out design concentrated all transmit and receive components at the magnet.

Thanks to the Zero Helium boil-off technology, the system does not use any helium during normal operation, so this expensive and scarce resource does not need regular refill intervals. Additionally, with the new Green Cooling Package (option), customers can decrease their energy consumption for cooling by up to 50%[1].

Energy consumption during use accounts for over three-quarters of the environmental impact of medical products. Siemens strives to develop new solutions that are more energy efficient than their predecessor models.

Key product features

- AudioComfort - for a significant acoustic noise reduction
- Ultra-light and short 1.5T system – easy to site and reduced cost of ownership – Tim 4G and Dot
- Tim Dockable Table option – mobility done right



[1] Data on file. Results may vary.

Key differentiator

Dot is a new way of scanning in MRI. Your benefits include increased consistency and reproducibility, greater ease-of-use, and higher productivity. This ultimately increases the number of examinations that can be done with one system – as a result, increasing the energy efficiency.

Close-to-zero helium consumption

MAGNETOM Avanto^{fit} 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 Avanto^{fit} requires no helium refill in normal clinical use. The only time minor helium loss may not be completely avoidable is during maintenance. The technology allowed Siemens to increase refill intervals of typically one year to over ten years for your MAGNETOM system without any increase in energy consumption for cooling. Depending on the frequency and type of applications used, overall savings of up to 1,300 liters of liquid helium per year are possible.

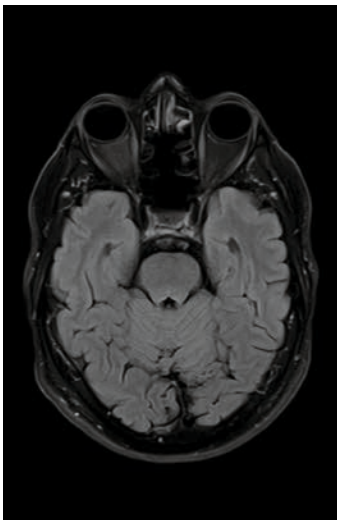
Helium is extracted from natural gas, which makes it of restricted availability. To achieve its cooling performance, it must be liquefied. If helium reaches the atmosphere, it will eventually escape to the universe due to its low weight and be lost forever.

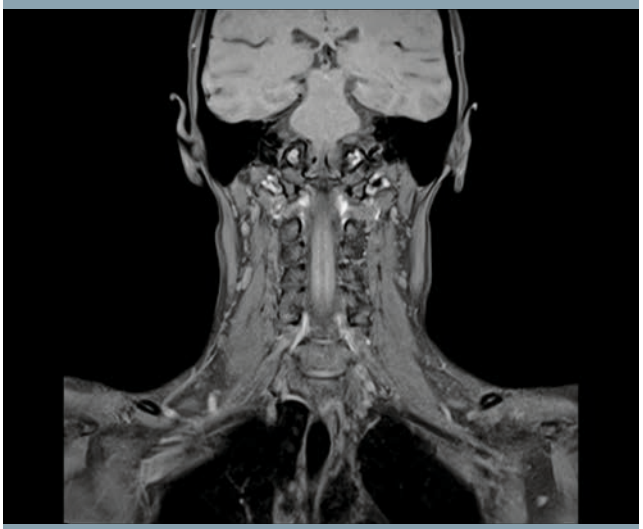
Environmental benefits

- **Acoustic noise reduced by up to 30 decibel**
- **Better energy efficiency with new workflow technology Dot and Tim 4G**
- **Zero Helium boil-off**
- **Green Cooling Package (optional) with automatic adaption to cooling requirements to decrease energy consumption for cooling by up to 50%[1]**

Customer benefits

- **Excellent patient comfort through acoustic noise reduction**
- **Up to 50% higher productivity through Tim 4G and Dot[1]**
- **Reduced lifecycle costs by increased energy efficiency and no equipment room cooling costs**
- **Low siting requirements due to ultra-short and lightweight magnet technology**





[1] Data on file. Results may vary.

Environmental management system

Our management system for environmental protection, health and safety is certified to ISO14001 and OHSAS18001 and helps us put our policy into practice. To find further information about our management system for environmental protection, health and safety, go to:

www.siemens.com/healthcare-ehs

Environmental product design

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

Production/delivery: From production of components to operation start-up 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

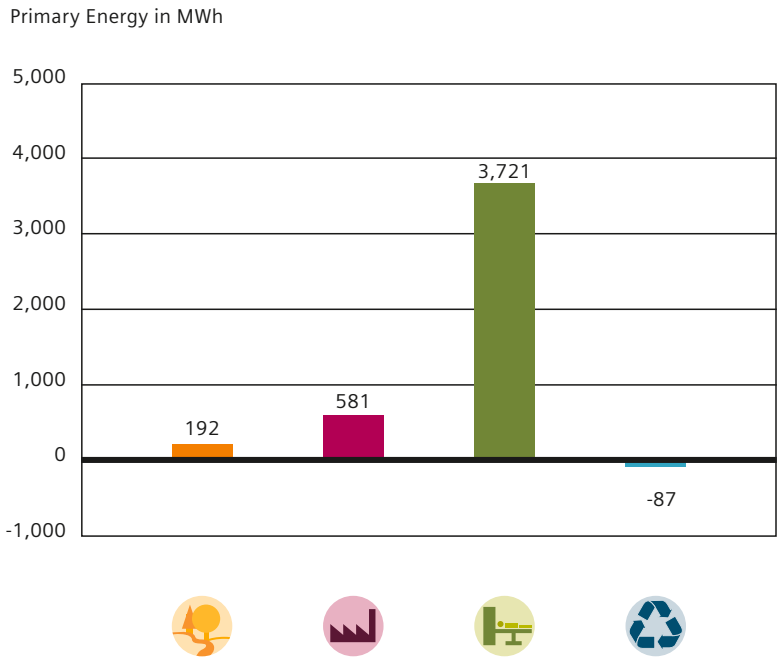
Siemens Healthcare considers environmental aspects in all phases of the product lifecycle, including material supply, production/delivery, use/maintenance and end of life.

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

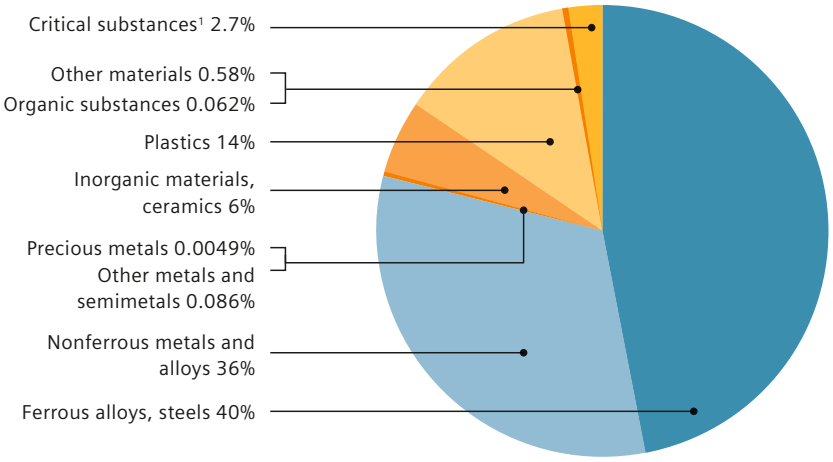
Energy consumption is the most important environmental aspect of medical devices. This is why we use cumulative energy demand to assess environmental performance. Cumulative energy demand is the total primary energy[1] that is necessary to produce, use and dispose of a device – including all transportation. Our medical devices can be recycled almost completely for materials or energy. With an appropriate end-of-life treatment, it is possible to return 87 MWh in form of secondary raw materials or thermal energy to the economic cycle.



[1] Primary energy is the energy contained in natural resources prior to undergoing any man made conversions (e.g. oil, solar).

Identification of product materials

MAGNETOM Avanto[fit] is mainly built out of metals. This ensures a high recyclability.

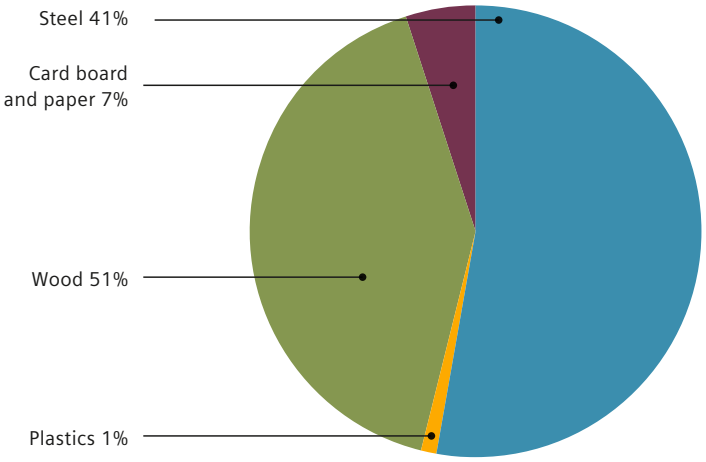


Total weight: approx. 7,672 kg

[1] Electrolytes and superconducting joints

Packaging

Our magnetic resonance imaging systems are transported within Europe in open packaging. The magnet is only protected by a light dust protective cover. A closed packaging is required for oversea transports. Here, the magnet is delivered on a reusable steel pallet. The values shown on the chart are average values from these two kinds of packaging. The packaging reuse ratio 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. 240 kg
- closed packaging approx. 2,532 kg

Product take back

Most of the materials used to produce MAGNETOM Avanto[fit] are recyclable. Around 90% (by weight) can be recycled for material content and 10% for energy.

Our product take back program ensures 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	
basic load[1]	12.5 kW
full load[2]	17.8 kW
Allowed room temperature[3]	18°C - 22°C
Allowed room humidity[3]	40 - 60%
Noise level	**SQ**
basic load[1]	≤ 60 dB (A)
full load[2]	≤ 99 dB (A)[6]
Energy consumption[7]	
during ramp up[4]	5.5 - 12.5 kW
basic load[1]	12.5 kW
full load[2]	17.8 kW
Power-on time[4]	7 min
Power-off time[5]	7 min

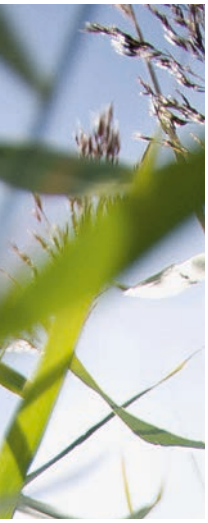
[1] Device is in operation but no patient examination takes place
[2] Average value for energy consumption at examination of patients
[3] Within examination room
[4] From off-mode to operating state
[5] From operating state to off-mode
[6] According to NEMA in magnet room
[7] All data incl. cold head compressor, without cooling

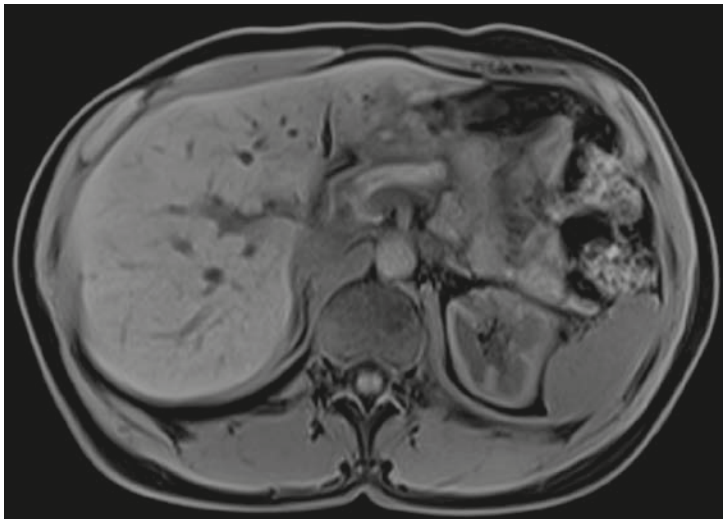
Technical specifications

Interface for heat recovery	✓
Possible type of cooling	Water-cooling
Complete switch-off is possible	⦸
Device is adjustable for the user in terms of height	✓
Uniform operating symbols for device families	✓

Radiation

Measures/techniques to minimize ionizing radiation exposure	not applicable
Minimization compared to the limit value for patients	not applicable
Measures/techniques to minimize ionizing radiation exposure to electromaqnetic radiation	actively shielded magnet actively shielded gradients if necessary magnetic shielding HF-cabine with 90 dB damping
Minimization compared to the limit value for users	individual






Replacement parts and consumables

Item	Lifecycle[1]
Absorber	every 2 years
Accu (Patient trolley)	optional
ERDU-battery	every 2 years
Cold head	every 2 years
Vacuum pump filter	every 2 years
EKG-Electrodes	disposable material

[1] Recommended exchange interval

Disposal / substance information

End of life concept	✓
Recycling information	✓
List of hazardous substances (not contained in the device)	✓

Cleaning

Incompatible cleaning processes	
total device	⦸
restrictions for particular device components	⦸
List of incompatible substance classes	
total device	alcoholic/etheric disinfections sprays organic solvents scouring solvents products containing phenolalcylamin / lye
restrictions for particular device components	⦸
Suitability of the device for sterile areas	⦸
Size of the surface to be cleaned[2]	approx. 5 m²

[2] Body Coil (inside), patient table overlay, local-coil, control element, console, keypad, intercom, mouse

Further ecologically relevant information

Elements of instruction are	
recommendations for savings energy	✓
recommendations for efficient cleaning	⦸
recommendations for appropiate use of consumables	✓

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