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MAGNETOM Spectra

Environmental Product Declaration

MAGNETOM Spectra

The key to 3T.

MAGNETOM Spectra provides excellent Siemens 3T image quality. Through the integration of groundbreaking Tim 4G (Total imaging matrix) and DotGO (Day optimizing throughput), MAGNETOM Spectra sets a new standard of efficiency, easy to 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.

MAGNETOM Spectra also has low operational costs and is easy to site. As the shortest 3T system in its class, it fits into the footprint of most conventional 1.5T systems. There is no need for a large, dedicated computer room, because the all-digital Tim 4G technology is concentrated at the magnet.

Thanks to the Zero Helium boil-off technology, the system does not consume any helium during normal operation, so this expensive and scarce resource does not need regular refill intervals.

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

Key product features

- Siemens 3T image quality with Tim4G
- Easy and streamlined workflow with DotGO
- Ultra-light and short 3T system – Low installation cost through small footprint and fast installation
- Attractive cost position and optimum TCO (Total Cost of Ownership)
- Power saving technology enables higher energy efficiency

Key differentiator

Tim 4G is Siemens' ultimate innovation technology that unlocks imaging power like never before. It helps enhance the image quality as well as the processing speed by providing with DirectRF and TimTX TrueForm, which increases SNR and reduces scan time. This ultimately increases the number of examinations that can be done with one system – as a result, increasing the energy efficiency.

Zero Helium boil-off magnet technology

MAGNETOM Spectra 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 Spectra requires no helium refill in normal use.

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

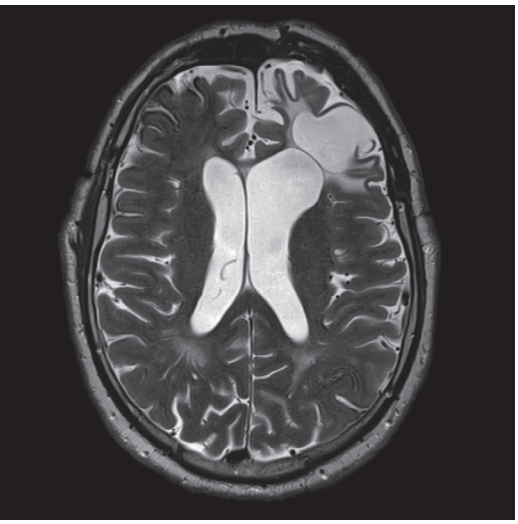
Resource-conserving and economical

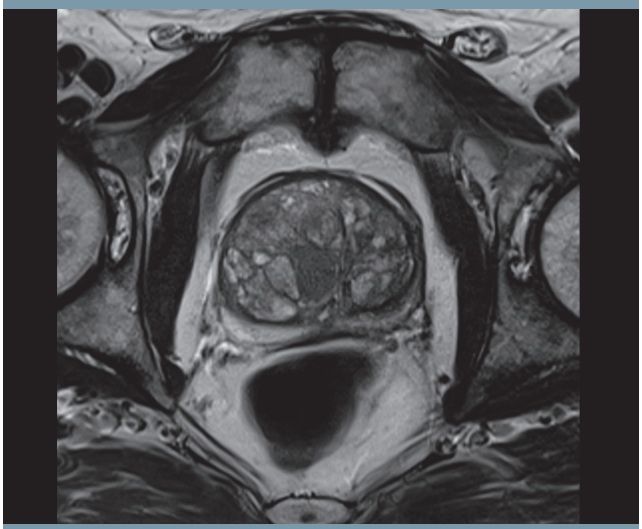
- **Better energy efficiency with new workflow technology Dot and Tim 4G**
- **Zero Helium boil-off**
- **Optimized cooling system with optional EcoChiller**
- **Noise optimized magnet design**
- **Low installation requirements due to small footprint and fast installation**

Customer benefits

Unprecedented access to 3T

- **Increased productivity through Tim 4G and DotGO**
- **Reduced life-cycle costs by increased energy efficiency and no equipment room cooling costs**
- **Ultra-short and lightweight magnet technology requires a smaller installation area that fits into most 1.5T footprints**
- **Excellent patient comfort options allow for increased marketability and accommodation of more patients**





Environmental Management System

Siemens Healthcare gives high priority to achieving excellence in Environmental Protection, Health Management and Safety (EHS). Across the globe, Siemens Healthcare 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.

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

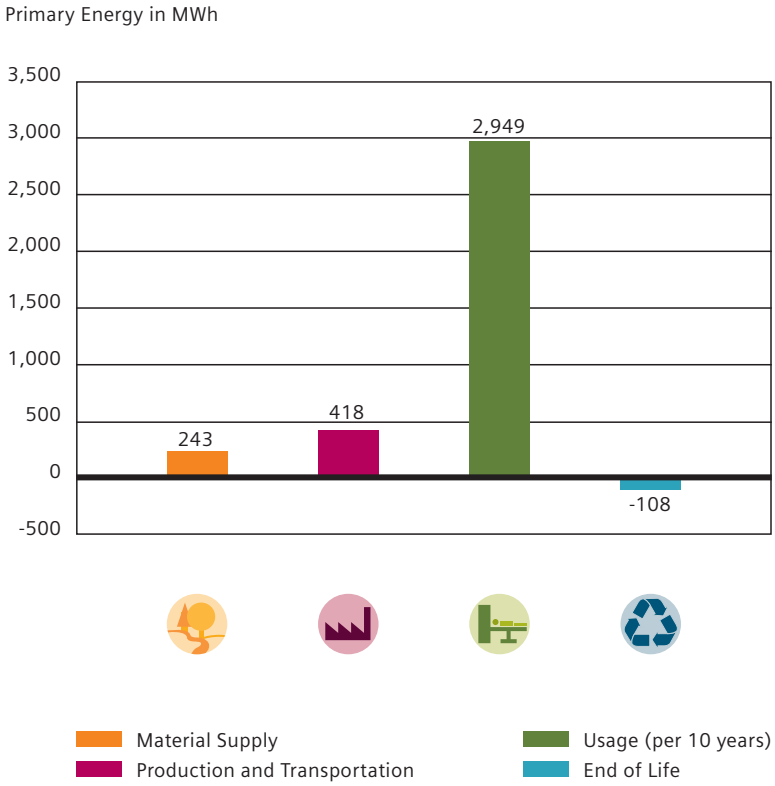
Our product design procedure fulfills the requirements of IEC60601-1-9:2007 "Environmental product design for medical electrical equipment".

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 energy* 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 108 MWh in form of secondary raw materials or thermal energy to the economic cycle.

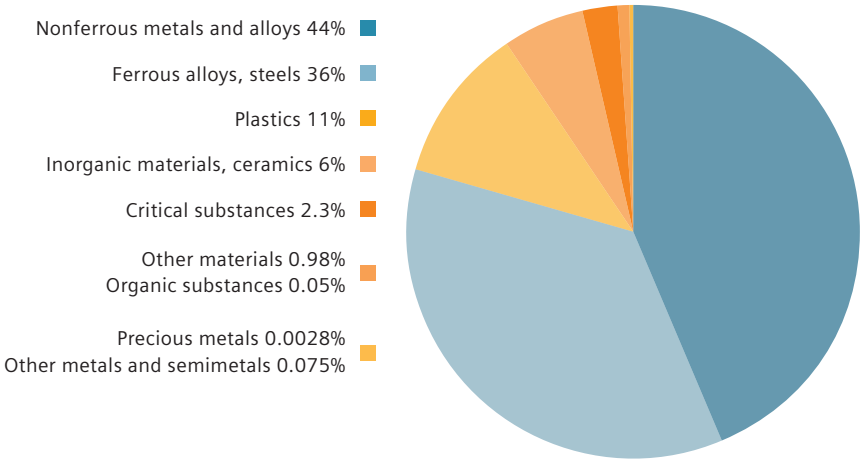


* Primary energy is the energy contained in natural resources prior to undergoing any man made conversions (e.g. oil, solar).

** All energy consumption data measured according to COCIR Ecodesign Initiative: MRI – Measurement of the energy consumption: Methodology

Identification of Product Materials

MAGNETOM Spectra is mainly build out of metals. This ensures a high degree of recyclability.

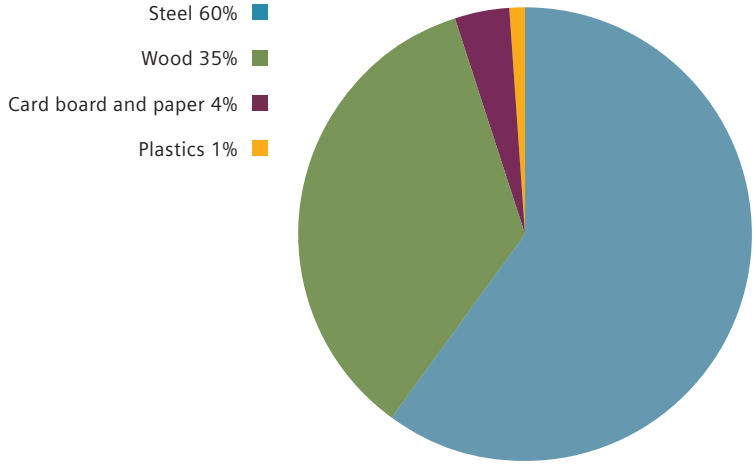


Total weight: approx. 9,500 kg

Packaging

Our magnetic resonance imaging systems are transported by flat truck for airfreight (most of carton box) and by 40' open top container for sea freight (the components packed by vacuum packing and wooden box) and domestic delivery (most of carton box).

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 packing weight:

- airfreight or domestic delivery packaging approx. 2,350 kg
- seafreight delivery packaging approx. 2,650 kg

Product Take Back

Most of the materials used to produce MAGNETOM Spectra are recyclable. 93% (by weight) can be recycled for material content and 7% for energy (based on the material composition chart.

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	
Ready for measurement[1]	8.7 kW
Typical examination[2]	13.1 kW
Allowed room temperature[3]	18°C–22°C
Allowed relative humidity[3]	40–60%
Noise level	
Basic load[1]	≤ 55.3 dB (A)
Full load[2]	≤ 79.3 dB (A)[6]
Energy consumption[7]	
System off[4]	6.1–8.7 kW
Ready for measurement[1]	8.7 kW
Typical examination[2]	13.1 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] Measured according to NEMA in magnet roome

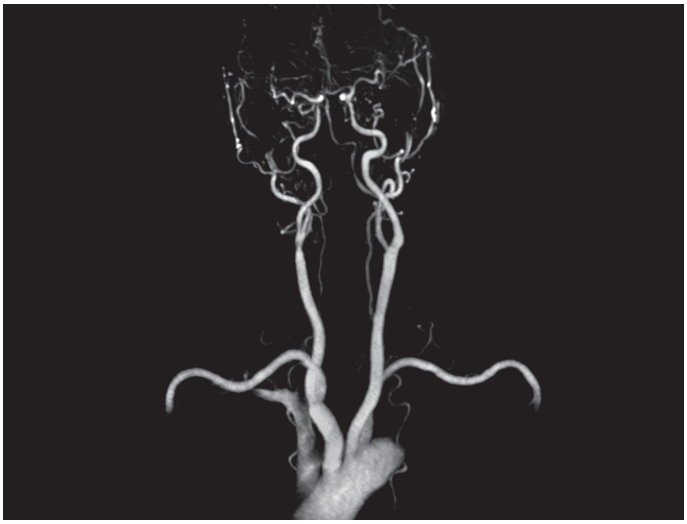
[7] All values are typical values, applicable for 400 V/50 Hz
Consumption or optional separator pump and other options not included
Peak power in scan mode is significantly higher

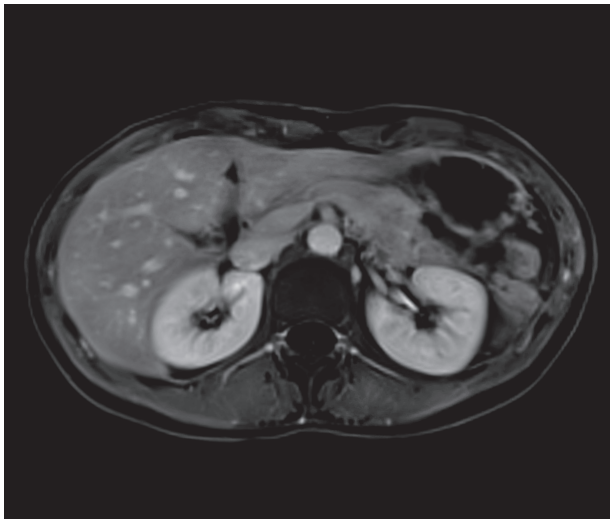
Technical Specifications

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 the exposure to electromagnetic 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	Life cycle*
Absorber	every 3 years
Accu (Patient trolley)	optional
Cold head	every 2 years
Vacuum pump filter	every 2 years
EKG-Electrodes	one way material

*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*	approx. 5 m^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 saving energy	✓
Recommendations for efficient cleaning	⦸
Recommendations for appropriate use of consumables	✓

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