

# MAGNETOM Sempra Environmental Product Declaration

SIEMENS  
Healthineers



MAGNETOM Sempra

A Tim+Dot System

HEALTHINEERS

# MAGNETOM Sempra

## Daily success with 1.5T

Achieving success every day is the result of many small things going well and accumulating to generate the results you need. The new MAGNETOM Sempra system is designed to do just that: deliver consistent high quality, expand your clinical capabilities, and provide financial certainty. Brain, spine, and MSK exams make up an average of 75 percent of routine daily cases. MAGNETOM Sempra is perfectly equipped to deliver reliable consistency especially for these, including hard-to-image patient groups. Faster exams, reduced operating costs, and an innovative service concept ensure a reduced TCO – and daily success – day in and day out.

## Key product features

- Consistent quality with up to 75%<sup>1</sup> of routine exams covered by the Dot engines.
- Up to 97%<sup>2</sup> noise reduction in sound pressure for brain, spine and MSK exams.
- Higher throughput and patient satisfaction with 10-min<sup>3</sup> exams.
- Up to 30%<sup>4</sup> energy savings in standby mode with Eco-Power.

Up to  
**30%**  
savings in service with  
Siemens Healthineers  
Connect Plan





## Key differentiator

Tim+Dot are the direct response to today's demanding world of healthcare economics.

Tim is Siemens' integrated coil technology and has made fast, flexible, and accurate scans the standard in MRI. DotGO helps to take the complexity out of MRI and at the same time allows to achieve consistently expert results faster & easier than ever before.

Together, they redefine a highly efficient operation allowing the operator to focus more on their patients instead.

MAGNETOM Sempra helps our customers reduce their total cost of ownership with small footprint and power saving technologies like Eco-Power. The all-new Siemens Healthineers Connect Plan embedded in MAGNETOM Sempra provides transparent and low service costs for three years with highest uptime and least interruption to the customers' workflow.

All together, this results in lower cost per scan.

## Zero Helium boil-off magnet technology

MAGNETOM Sempra 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 Sempra requires no helium refill for up to 10 years under normal operating conditions.

Helium is extracted from natural gas, which makes it of restricted availability.

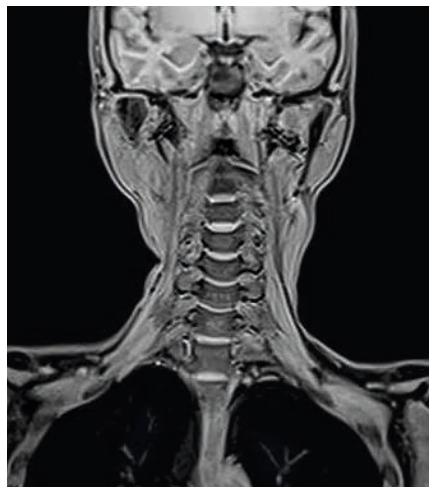
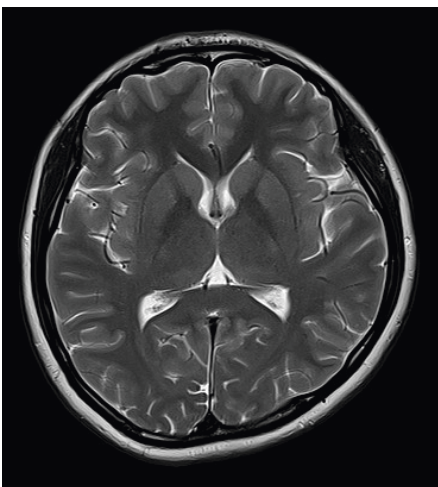
To achieve its cooling performance, it must be liquefied. If helium reaches the atmosphere, it will eventually escape to the universe due to its low weight and be lost forever.

### Environmental benefits

- Reduction of energy consumption with Eco-power technology<sup>5</sup>
- State-of-the-art, Zero Helium boil-off technology
- Nearly 90% of the materials<sup>6</sup> used can be returned to the flow of recyclable materials
- Reduced acoustic noise level during scanning with Quiet Suite brings higher patient comfort

### Customer benefits

- Tim+Dot technology enables consistently high image quality as well as higher productivity
- Higher throughput with low TCO (Total Cost of Ownership) resulting in a fast break-even
- Latest software platform enables cutting edge technologies to expand service scope



## 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.

[www.siemens.com/healthcare-ehs](http://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 Healthineers considers environmental aspects in all phases of the product life cycle, including material supply, production/delivery, use/maintenance and end of life.

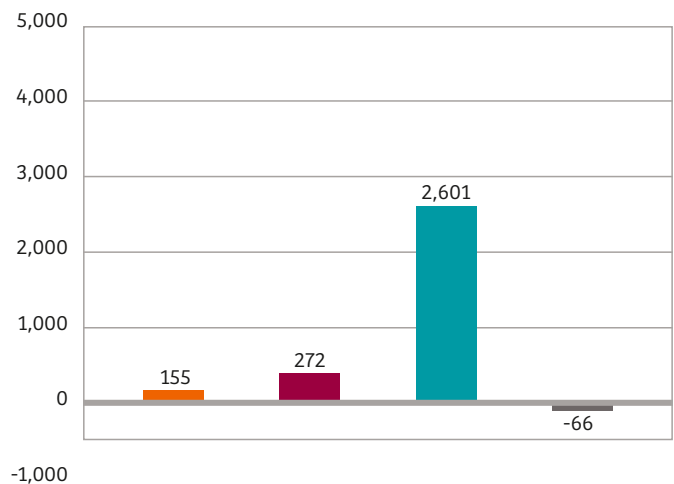
Our product design procedure fulfills the requirements of IEC60601-1-9:2007 "Environmental product design for medical electrical equipment".

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 energy<sup>7</sup> 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 66 MWh in form of secondary raw materials or thermal energy to the economic cycle.

Primary Energy in MWh



Material supply

Production and transportation

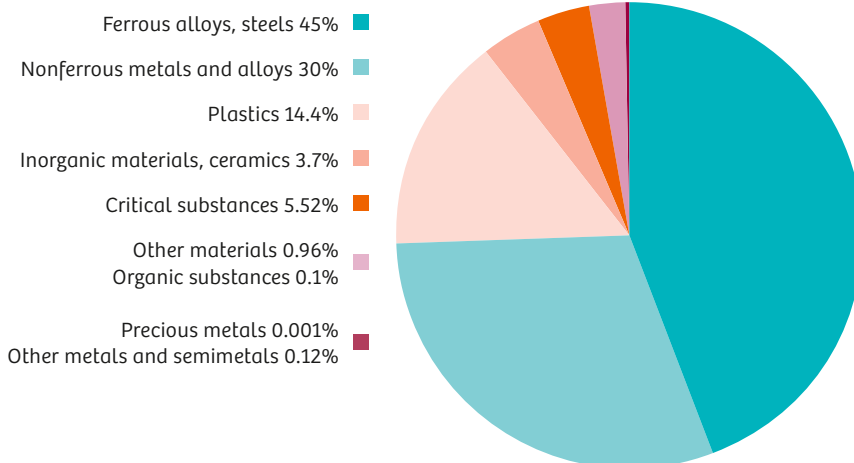
Usage (per 10 years)

End of life

## Identification of product materials

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

Total weight: approx. 6,195 kg



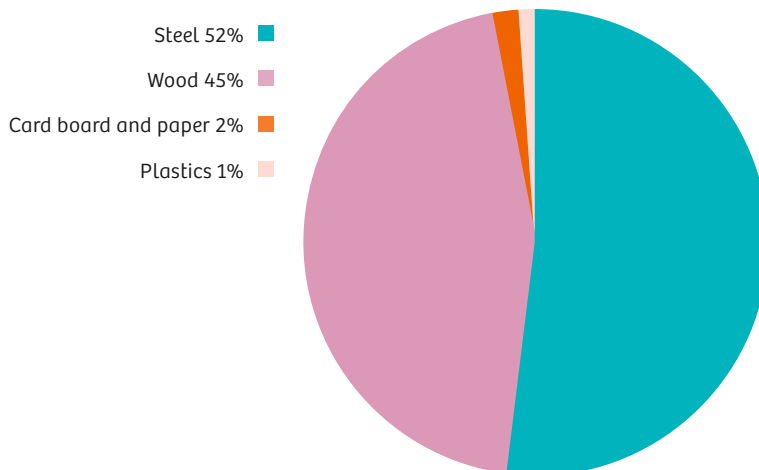
## Packaging

Our MRI systems are transported by 40' 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 (same as airfreight delivery). 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:

- airfreight or domestic delivery packaging approx. 2,300 kg
- seafreight delivery packaging approx. 2,600 kg



## Product take back

Most of the materials used to produce MAGNETOM Sempra are recyclable. 93% (by weight) can be recycled for material content and 7% 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

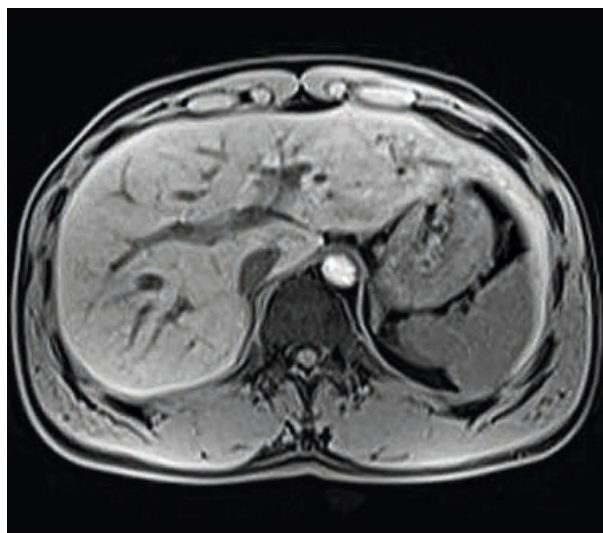
<b>Heat emissions of the device<sup>14</sup></b>	
Ready for measurement <sup>8</sup>	≤ 7.4 kW
Typical examination <sup>9</sup>	≤ 10.8 kW
<b>Allowed room temperature<sup>10</sup></b>	18°C–22°C
<b>Allowed relative humidity<sup>10</sup></b>	40–60%
<b>Noise level</b>	
basic load <sup>8</sup>	≤ 61.0 dB (A) <sup>9</sup>
full load <sup>9</sup>	≤ 85.0 dB (A) <sup>9</sup>
<b>Energy consumption<sup>14</sup></b>	
System off	4.4 kW
Ready for measurement <sup>8</sup>	7.4 kW
Typical examination <sup>9</sup>	10.8 kW
<b>Power-on time<sup>11</sup></b>	7 min
<b>Power-off time<sup>12</sup></b>	7 min

## 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 <sup>15</sup>
Absorber	every 3 years
ERDU-battery	every 2 years
Cold head	every 2 years
EKG-Electrodes	disposable material

## Disposal / substance information

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

## Further ecologically relevant information

### Elements of instruction are

recommendations for savings energy	✓
recommendations for efficient cleaning	⊗
recommendations for appropriate use of consumables	✓

## 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 phenolalcyclamin / lye

restrictions for particular device components	⊗
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Suitability of the device for sterile areas	⊗
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Size of the surface to be cleaned <sup>12</sup>	approx. 5 m <sup>2</sup>
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For accessories, please visit:  
[www.siemens.com/medical-accessories](http://www.siemens.com/medical-accessories)

- 1 Evaluation of MRI utilization. Based on 2.2 million Siemens MR examinations in 2013.
- 2 Decibel measurements and images acquired on MAGNETOM Semptra. Data on file; results may vary.
- 3 Assumes user interaction and coil setup in 1:30 min or less.
- 4 Data on file; results may vary.
- 5 Compared with installed 1.5T MR systems.
- 6 Data on file; results may vary.
- 7 Primary energy is the energy contained in natural resources prior to undergoing any man made conversions (e.g. oil, solar).
- 8 Device is in operation but no patient examination takes place.
- 9 Average value for energy consumption at examination of patients.
- 10 Within examination room.
- 11 From off-mode to operating state.
- 12 From operating state to off-mode.
- 13 Measured according to NEMA in magnet room.
- 14 All values are typical values, applicable for 400 V/50 Hz. Consumption or optional separator pump and other options are not included. Peak power in scan mode is significantly higher. 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.
- 15 Recommended exchange interval.
- 16 Body Coil (inside), patient table overlay, local-coil, control element, console, keypad, intercom, mouse.

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