MAGNETOM ESSENZA
Environmental Product Declaration
MAGNETOM ESSENZA

Established 1.5 T performance. With Tim + Dot.

Built with the experience of more than 2,000 customers in the field, MAGNETOM ESSENZA, a Tim+Dot system, will enable you to be even more productive, more versatile, and more confident in your daily MRI practice.

- By bringing Dot (Day optimizing throughput) together with Tim (Total imaging matrix), boosting image quality and consistency while helping take the complexity out of MRI.
- By being equipped with the latest application platform, providing more standard and advanced applications than ever before.
- Through reassuring investment and operating costs, defining a faster return on investment and sustainable value.

Key product features

- Steady, reliable performance with virtually 100% uptime;
- Tim+Dot technology: fast, high-quality and easy-to-use 1.5T imaging;
- Latest syngo MR E11* platform; access to new routine and advanced clinical applications from head-to-toe;
- Low operating cost with self-adapting components which switch off automatically when not needed;
- Short magnet design providing higher patient comfort and low installation requirements.

*syngo MR E11 for MAGNETOM ESSENZA is still under development and not commercially available yet. Its future availability cannot be ensured.
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 productivity – with an increase of up to 50%. MAGNETOM ESSENZA combines Tim+Dot with a highly attractive total cost of ownership and a highly efficient operation. Besides the highly attractive cost position, this also results in an extremely low power consumption per examination and in the end defines a benchmark in energy efficiency.

Zero Helium boil-off magnet technology

MAGNETOM ESSENZA 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 ESSENZA 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

• Reduction of energy consumption*
• Optimized cooling system with optional EcoChiller
• State-of-the-art, Zero Helium boil-off technology
• Nearly 90% of the materials** used can be returned to the flow of recyclable materials

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
• Established performance enhanced by latest software platform, providing future security

*Compared with installed 1.5T MR systems
**Data on file; results may vary
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 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 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 60 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).
Precious metals 0.0021%

Most of the materials used to produce MAGNETOM ESSENZA are recyclable. 96% (by weight) can be recycled for material content and 4% 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.

Identification of product materials

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

Total weight: approx. 6,500 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. 2,200 kg
• seafreight delivery packaging approx. 2,450 kg

Product take back

Most of the materials used to produce MAGNETOM ESSENZA are recyclable. 96% (by weight) can be recycled for material content and 4% for energy.
Operating data

<table>
<thead>
<tr>
<th>Heat emissions of the device(^{7})</th>
<th>Ready for measurement(^{1})</th>
<th>≤ 7.4 kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical examination(^{2})</td>
<td>≤ 11.9 kW</td>
<td></td>
</tr>
<tr>
<td>Allowed room temperature(^{3})</td>
<td>18°C–22°C</td>
<td></td>
</tr>
<tr>
<td>Allowed relative humidity(^{4})</td>
<td>40–60%</td>
<td></td>
</tr>
</tbody>
</table>

| Noise level                          | basic load\(^{1}\)            | ≤ 70 dB (A)\(^{6}\) |
|                                      | full load\(^{2}\)             | ≤ 91 dB (A)\(^{6}\)  |

| Energy consumption\(^{7}\)          | System off                     | 6.1 kW               |
|                                      | Ready for measurement\(^{1}\)  | 7.4 kW               |
|                                      | Typical examination\(^{2}\)    | 11.9 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 room |
| 7 All values are typical values, applicable for 400V/50Hz |
| Consumption or optional separator pump and other options 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 value.

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-cabin with 90 dB damping |
| Minimization compared to the limit value for users | individual |
**Replacement parts and consumables**

<table>
<thead>
<tr>
<th>Item</th>
<th>Life cycle*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absorber</td>
<td>every 3 years</td>
</tr>
<tr>
<td>ERDU-battery</td>
<td>every 2 years</td>
</tr>
<tr>
<td>Cold head</td>
<td>every 2 years</td>
</tr>
<tr>
<td>EKG-Electrodes</td>
<td>disposable material</td>
</tr>
</tbody>
</table>

*Recommended exchange interval

**Cleaning**

<table>
<thead>
<tr>
<th>Incompatible cleaning processes (total device)</th>
<th>☀</th>
</tr>
</thead>
<tbody>
<tr>
<td>restrictions for particular device components</td>
<td>☀</td>
</tr>
</tbody>
</table>

**List of incompatible substance classes**

- alcoholic/etheric disinfections
- sprays
- organic solvents
- scouring solvents
- products containing phenolaclyamin / lye

**Disposal / substance information**

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

**Size of the surface to be cleaned**

- approx. 5 m²

*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 appropriate use of consumables ✓
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