



SOMATOM Definition

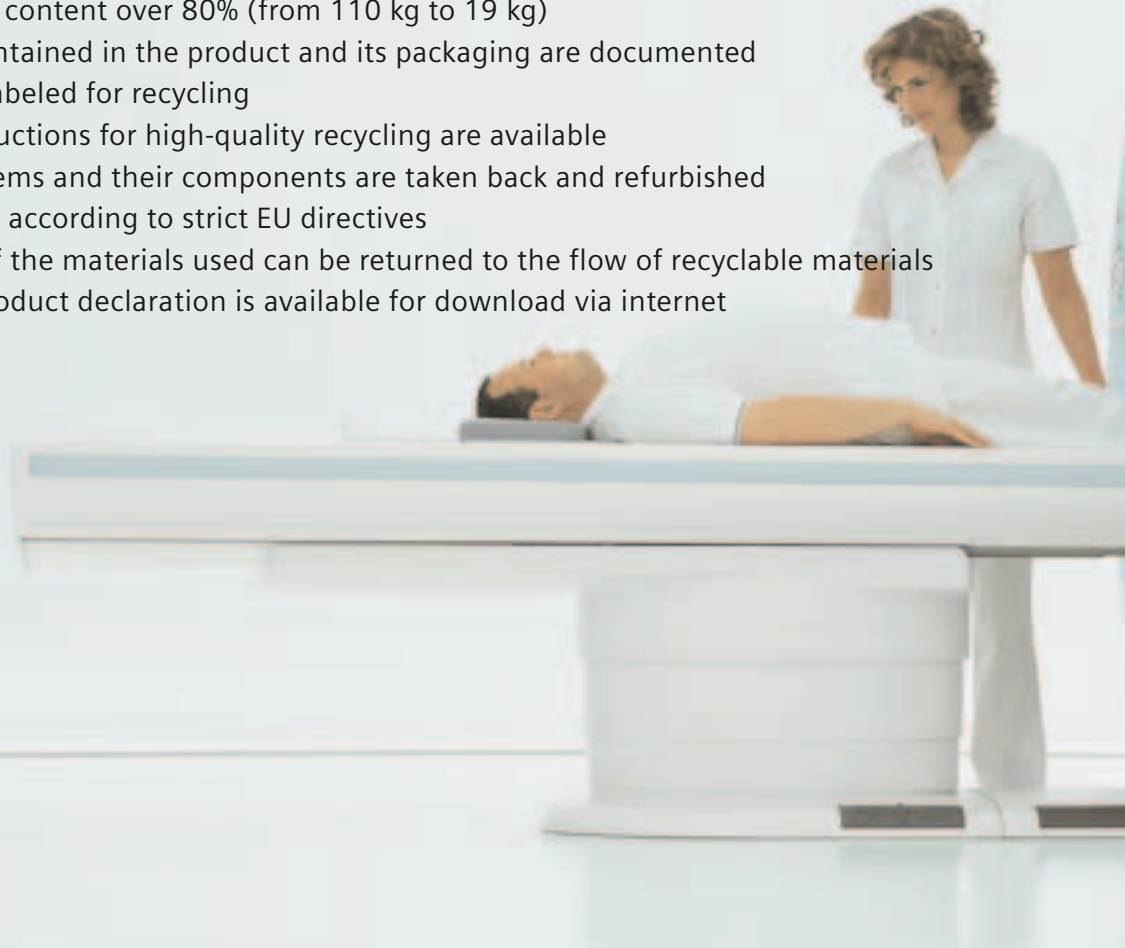
Environmental Product Declaration

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Progress that is Impressive – Ecological Advantages of SOMATOM Definition

- Dose reduction for heart examinations up to 50%
- Energy savings of up to 30% for standard examinations
- Reduction of lead content over 80% (from 110 kg to 19 kg)
- All substances contained in the product and its packaging are documented
- Plastic parts are labeled for recycling
- Disassembly instructions for high-quality recycling are available
- Complete CT systems and their components are taken back and refurbished
- Product take-back according to strict EU directives
- More than 95% of the materials used can be returned to the flow of recyclable materials
- Environmental product declaration is available for download via internet



Validated information according to EMAS is marked by a grey background and the statement EMAS: validated information.

SOMATOM Definition: Reduction of Lead Content

Rotating components of CT-systems have to be balanced for a quiet running. The easiest way is the use of lead as counter balance. But lead is a toxic element. Therefore we abandoned the usage of lead as counter balance at SOMATOM Definition completely. But lead is also necessary for shielding and shaping of radiation. There is no technically and economically feasible alternative at present. Nevertheless it was possible to optimize this lead content.

Altogether the lead content was reduced from 110 kg to 19 kg, this means a reduction of more than 80% compared to SOMATOM Sensation 16.

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Dual Source CT.

As the first CT-system worldwide SOMATOM Definition offers two x-ray tubes and two detector systems. This allows cardiac imaging twice as fast as with the fastest single source CT.* Not only independent of the heart rate, but also without the compromises of beta-blockers or multisegment reconstruction.

Besides, SOMATOM Definition opens the door to Spiral Dual Energy imaging, enabling material characterization in a single scan.

* Competitive information provided is based on interpretation of available data and may require independent verification.

Reduction of Dose and Energy Consumption

It was a challenge to reduce energy consumption and dose in spite of two X-ray tubes. The following three actions led to success:

- Modulation of X-rays to different heart phases
- Patient table travelling speed adapted to pulse rate
- Bowtie-filter protects surrounding tissue

Reduction of energy consumption during examinations leads mostly to a reduction of absorbed radiation dose.

For heart examinations the reduction of dose amounts up to 50% compared to systems without any dose modulation.

Detectors of modern CT-systems consist of many rows. So X-rays can be utilized better and absorbed radiation doses can be reduced. Radiation dose is adapted to the density profile of respective body regions via the new CARE Dose4D™-technology. Adoption of dose modulation as well as increasing of detector rows generates energy savings of 30% during a normal thorax examination in comparison to SOMATOM Sensation 16-slice configuration.





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Environmental declaration 2006*

Environmental Management System



Our environmental, health and safety management system conforms to ISO 14001 and helps us put our policy into practice. Our German manufacturing facilities were among the first to be validated to EMAS (Environmental Management and Audit Scheme). You find further information about our environmental, health and safety management system at www.siemens.com/medical-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 Medical Solutions 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".

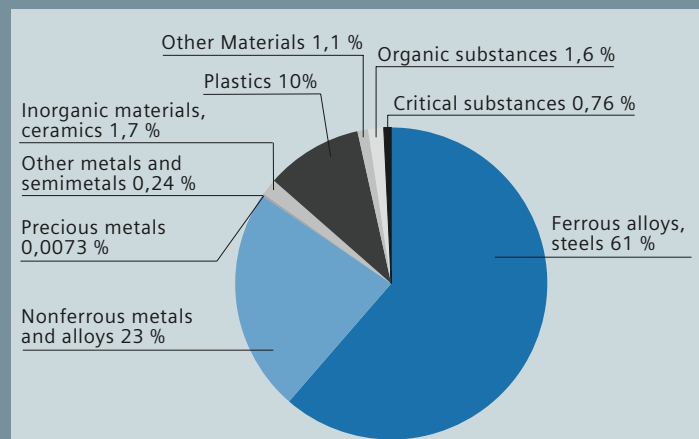
This standard supports the effort to improve the environmental performance of our products.

Identification of Product Ingredients

SOMATOM Definition is mainly build out of metals. This ensures a high degree of recyclability.

Total weight: **approx. 4850 kg**

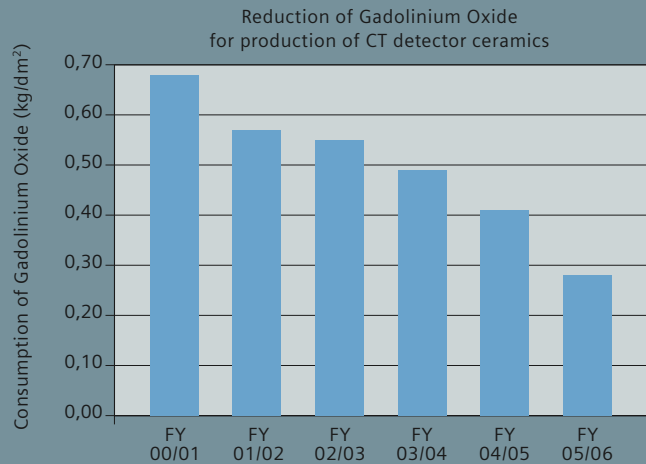
*EMAS: validated information
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Reduction of Critical Substances

The consumption of material per unit area for CT detectors was reduced significantly. Today we need only 40% of Gadoliniumoxide for production of a defined surface area of CT detector ceramics in comparison to five years ago.

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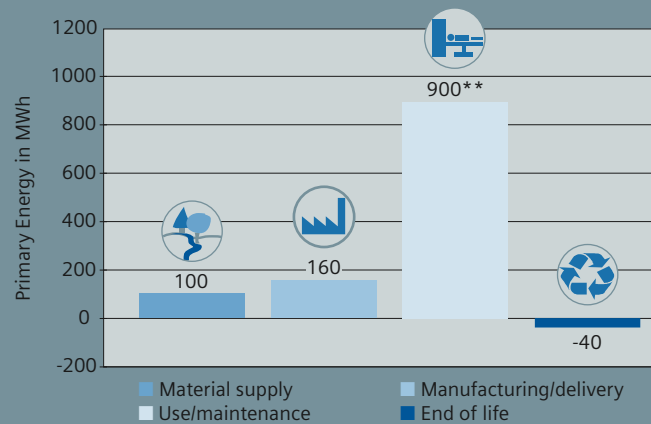


Cumulated Energy Demand

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 end of life treatment it is possible to return 40 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 human made conversions (e.g. oil, solar).

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** based on 60 patients per day, 20 sec scan time, 10 years usage

Product Take Back

The materials of which SOMATOM Definition is produced are mostly recyclable. 97 % (by weight) can be recycled materially and 3 % energetically.

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The high-performance X-ray tube assemblies are designed the way that as much parts as possible may be reused. At the end of life the tube assemblies are taken back and are refurbished. Quality is guaranteed by compliance to standard IEC 62390. Under optimal conditions up to 40% of a tube assembly may consist of reused parts.

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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	3,6 kW
- full load ²	15 kW
Allowed ambient temperature³	18°C - 28°
Allowed relative humidity	20 - 75%
Noise level	
- basic load ¹	≤ 57 dB(A)
- full load ²	≤ 64 dB(A)
Energy consumption:	
- during ramp up ⁴	4 - 14kW
- basic load ¹	3,3 kW
- full load ²	67,4 kW
Power-on time⁴	< 4 min
Power-off time⁵	< 2 min

¹ device is in operation but no patient examination takes place

² average value at examination of patients

³ within examination room

⁴ from off-mode to operating state

⁵ from operating state to off-mode

syngo[®], the ergonomic and user-friendly user interface supports the clinical workflow. The intelligent automation functions accelerate your examination and make a smooth, efficient workflow for all modalities, departments and people possible. With *syngo* your workplace is prepared for your mode of operation perfectly.

Technical Specifications	
Interface for heat recovery	✓
Possible type of cooling	Standard: water/water Optional: water/air
Complete switch-off is possible	✓
Device is adjustable for the user in terms of height	✓
Uniform operating symbols for device families	✓

Radiation	
Measures/technics to minimize ionizing radiation exposure	- Ultra Fast Ceramic (UFC) detectors - CARE Dose4D™ - Shaped Filter
Minimization compared to the limit value for patients	Minimization in % head 1,3% sinus -65,1% thorax -64,1% abdomen -37,1% pelvis -50,4% Oberbauch -39,4% spine -49,4% heart -59,0%
Measures/techniques to minimize the exposure to electromagnetic radiation	Not applicable
Minimization compared to the limit value for users	Not applicable

Replacement Parts and Consumables

Item	Life cycle*
x-ray tube	1 year warranty
UPS-battery	36 months

* 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
 - sprays
 - chlorine releasing agents
 - substituted phenols based agents
 - scouring cleaning agents
 - organic solvents
 - ammonia releasing agents
 - containing silicon agents
- restrictions for particular device components ☒

Suitability of the device for sterile areas ☒

Size of the surface to be cleaned* approx. 3 m²

* gantry-tunnel (inside), patient table overlay, control elements, 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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