

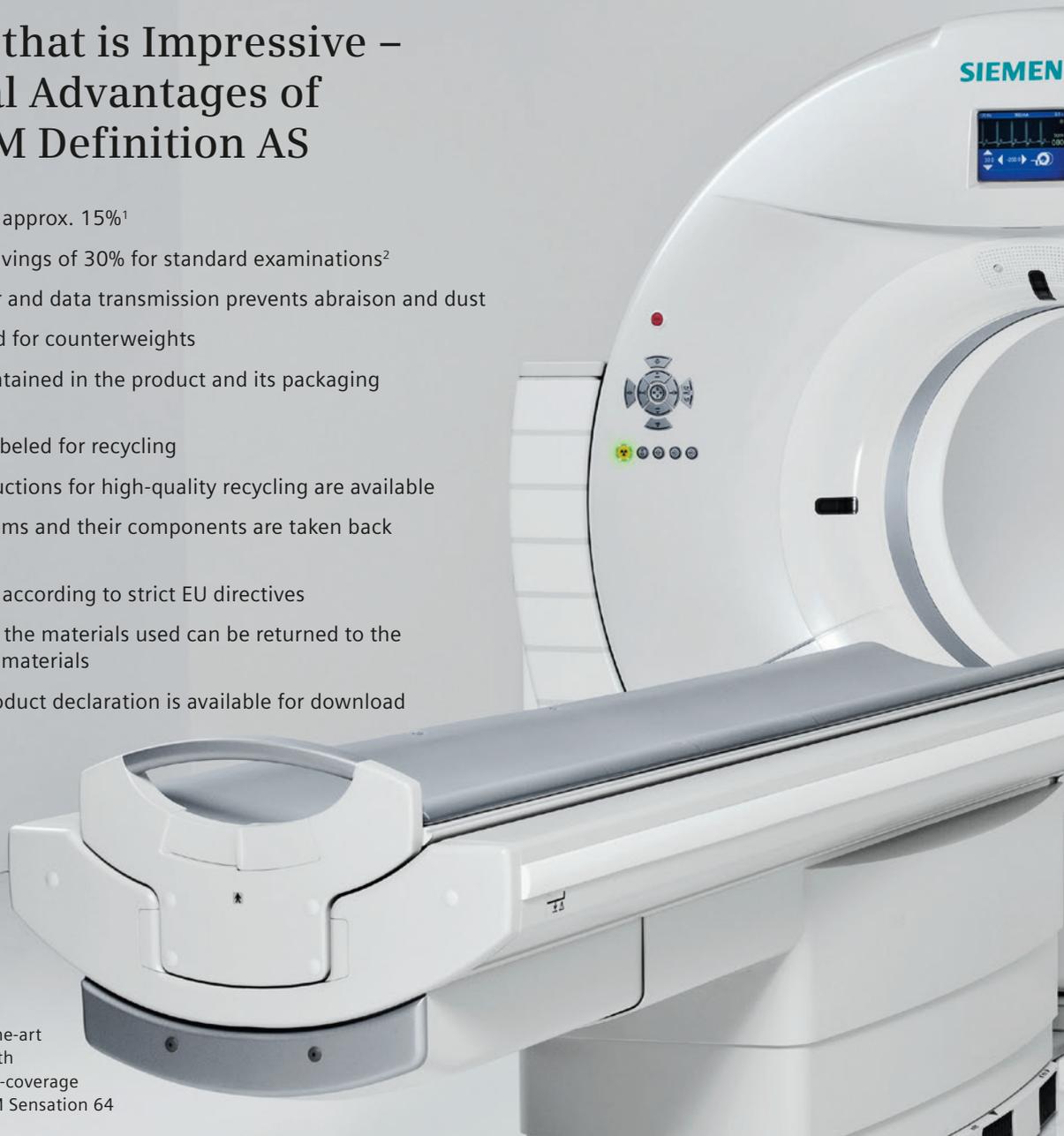
# SOMATOM Definition AS

Environmental Product Declaration

**SIEMENS**

# Progress that is Impressive – Ecological Advantages of SOMATOM Definition AS

- Dose reduction of approx. 15%<sup>1</sup>
- Average energy savings of 30% for standard examinations<sup>2</sup>
- Contactless power and data transmission prevents abrasion and dust
- No more lead used for counterweights
- 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 98% of the materials used can be returned to the flow of recyclable materials
- Environmental product declaration is available for download via internet



<sup>1</sup> Compared to state-of-the-art 64-slice CT scanners with approximately 40 mm z-coverage

<sup>2</sup> Compared to SOMATOM Sensation 64

## SOMATOM Definition AS: 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 the SOMATOM Definition AS completely. A minor amount of lead is only necessary for shielding and shaping of radiation. There is no technically and economically feasible alternative at present.

It was a challenge to further reduce energy consumption and dose compared to our successful predecessor models.

The following actions led to success: An adaptive dose shield mounted at the x-ray tube controls, that all unnecessary radiation is blocked from the patient. The average dose saving achieved by this unique technology is 15%<sup>1</sup>

<sup>1</sup> Compared to SOMATOM Sensation 64 (or 64 slice configuration with 40 mm z-coverage without adaptive dose shield)



## SOMATOM Definition AS

Our vision of the SOMATOM Definition continues today with the introduction of SOMATOM Definition AS, Maximize Outcome. Minimize Dose. It brings you a fundamentally new way to use single source CT. It is the only CT to adapt to your patients and your clinical questions – breaking through the barriers of conventional CT. Imagine a truly adaptive CT scanner that gives you what you need. A system that intelligently adapts, on the fly, to your patients and your clinical needs. Making it an expert in virtually any clinical field.

SOMATOM Definition AS produces not just the clearest image, but a clear solution to the clinical question. Opening up new worlds of clinical and economic possibilities. And increasing the quality and efficiency of patient care.

With SOMATOM Definition AS, you'll enjoy the only CT that is fully adaptable. It adapts to any patient, adapts for complete dose protection, adapts for new dimensions, and adapts to your space.

Detectors of modern CT-systems consist of many rows. So X-rays can be utilized better and absorbed radiation doses can be reduced. Increasing the number of detector rows generates average energy savings of 30% in comparison to SOMATOM Sensation 64-slice configuration.

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

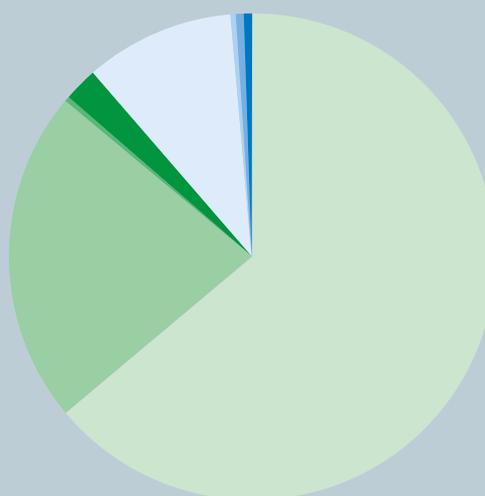
Our product design procedure fulfills the requirements of IEC60601-1-9:2007 "Environmental product design for medical electrical equipment".

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

## Identification of Product Ingredients

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

Total weight: approx. 3500 kg

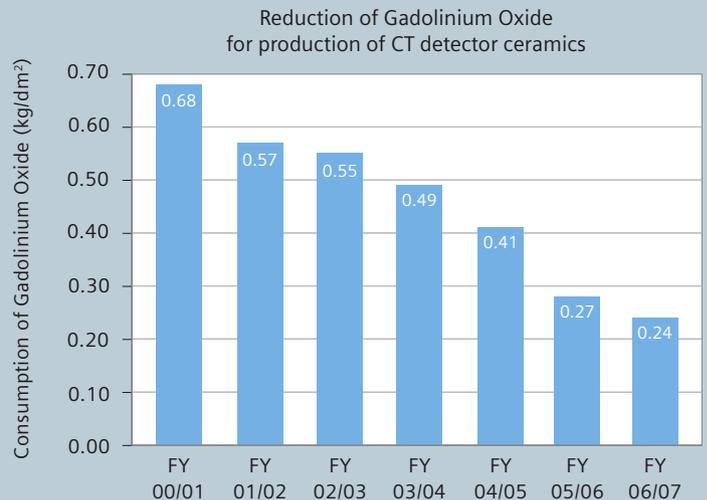


EMAS: validated information – Environmental declaration 2008

## Reduction of Critical Substances

The consumption of material per unit area for CT detectors was reduced significantly. In FY 06/07 we needed only 65% of Gadoliniumoxide for production of a defined surface area of CT detector ceramics in comparison to six years ago. The goal for FY 07/08 is an additional reduction of 4%.

EMAS: validated information – Environmental declaration 2008



## 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 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 33 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).

EMAS: validated information – Environmental declaration 2008



\*\* Based on 70 patients per day, 10 sec scan time, 10 years usage

## Product Take Back

The materials of which SOMATOM Definition AS is produced are mostly recyclable. 98% (by weight) can be recycled materially and 2% energetically.

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 62309. Under optimal conditions up to 40% of a tube assembly may consist of reused parts.

EMAS: validated information – Environmental declaration 2006 and 2008

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	
<b>Heat emissions of the device</b>	
– basic load <sup>1</sup>	< 3,1 kW
– full load <sup>2</sup>	< 15 kW
<b>Allowed ambient temperature<sup>3</sup></b>	18°C - 28°
<b>Allowed relative humidity</b>	20 - 75%
<b>Noise level</b>	≤ 68 dB(A)
<b>Energy consumption:</b>	
– basic load <sup>1</sup>	<3,1 kW
– full load <sup>2</sup>	~20 kW
– maximum load	125/140kVA optional
<b>Power-on time<sup>4</sup></b>	< 4 min
<b>Power-off time<sup>5</sup></b>	< 2 min

<sup>1</sup> device is in operation but no patient examination takes place

<sup>2</sup> average value at examination of patients (abdomen routine mode)

<sup>3</sup> within examination room

<sup>4</sup> from off-mode to operating state

<sup>5</sup> 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	Yes
Possible type of cooling	Standard: water/water Optional: water/air
Complete switch-off is possible	Yes
Device is adjustable for the user in terms of height	Yes
Uniform operating symbols for device families	Yes

Radiation			
Measures/techniques to reduce ionizing radiation exposure	<ul style="list-style-type: none"> <li>- Ultra Fast Ceramic (UFC) detectors</li> <li>- CARE Dose4D™</li> <li>- Shaped Filter &amp; Adaptive Dose Shield</li> </ul>		
Reduction compared to the limit value for patients	Minimization in %		
	<b>Organ:</b>	<b>Def AS+</b>	<b>Def AS</b>
	Head	-0,4%	-0,7%
	Sinus	-67,2%	-62,9%
	Thorax	-66,3%	-62,0%
	Abdomen	-41,1%	-33,5%
	Upper Abdomen	-43,4%	-36,2%
	Pelvis	-50,2%	-45,4%
	Spine	-52,7%	-46,6%
Measures/techniques to reduce the exposure to electromagnetic radiation	Not applicable		
Reduction 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	Yes
Recycling information	Yes
List of hazardous substances (not contained in the device)	Yes

Cleaning	
<b>Incompatible cleaning processes</b>	
– total device	Not applicable
– restrictions for particular device components	Not applicable
<b>List of incompatible substance classes</b>	
– total device	sprays chlorine releasing agents substituted phenols based agents scouring cleaning agents organic solvents ammonia releasing agents
– restrictions for particular device components	Not applicable
<b>Suitability of the device for sterile areas</b>	Not applicable
Size of the surface to be cleaned* user in terms of height	approx. 3 m <sup>2</sup>

\* gantry-tunnel (inside), patient tabel overlay, control elements, console, keypad, intercom, mouse

Further Ecologically Relevant Information	
<b>Elements of instruction are:</b>	
– recommendations for saving energy	Yes
– recommendations for efficient cleaning	Not applicable
– recommendations for appropriate use of consumables	Yes

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