SOMATOM Pro.Pulse

Environmental Product Declaration

siemens-healthineers.com/somatom-propulse

SIEMENS Healthineers

Progress that is impressive – ecological advantages of SOMATOM Pro.Pulse

- Average energy savings of 31% for standard examinations[1]
- Contactless 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

[1] *Energy savings compared to SOMATOM Drive according to the COCIR calculation model for power consumption over a 24h day (COCIR use scenario "Low Power")*

SOMATOM Pro.Pulse

Unlock Dual Source CT. Everywhere.

Today there are still too many patients who are not receiving high-quality CT imaging for a conclusive diagnostic assessment – especially those with challenging conditions such as irregular heart rates, inability to hold their breath, or difficulties following user instructions. Also, there are still too many patients that do not have easy access to high-quality CT imaging simply due to their location.

Our one-of-a-kind Dual Source technology enables a high temporal resolution and scan speed needed to reduce motion artifacts in patients with a high or irregular heart rate or with limited breath-hold capabilities, enhancing your diagnostic confidence – with the simplicity of myExam Companion. With our intelligent workflow, myExam Companion, the scanner offers a high level of user-friendliness and patient convenience – from intuitive user interfaces to visual patient instructions.

SOMATOM Pro.Pulse also boasts attractive offerings, including continuous staff education, digital fleet services, and reliable service solutions, making it a smart investment for a broad range of hospitals. In short, we designed SOMATOM Pro.Pulse to help you achieve operational excellence.

Discover SOMATOM Pro.Pulse and unlock Dual Source CT for your patients. Everywhere.

Dual Source CT: One-of-a-kind imaging technology
Radiology departments must be able to scan patients with large variety of clinical conditions 24/7. For this, they need advanced CT imaging solutions like SOMATOM Pro.Pulse. The CT scanner offers the technical advantages required to deliver high-quality images: high power, speed, and precision that only Dual Source CT can provide.

Intelligent workflow simplifies advanced imaging
Advanced CT imaging such as cardiac CT can be challenging for both patients and users. Unwanted scan variations, patient movement, or less compliant patients can affect the overall diagnostic quality. myExam Companion helps patients and users every step of the way, making the exam more comfortable while improving the consistency of the scan protocols.

High-end technology is now cost-efficient
When purchasing a CT scanner, there is more on your mind than just the equipment cost. Elements like infrastructure costs, continuous staff education, fleet management, or service costs are also crucial. With SOMATOM Pro.Pulse, we offer you an intelligently designed scanner that helps reduce the financial burden from the start – as well as comprehensive services, a broad education portfolio, ample fleet management tools, and more.

SOMATOM Pro.Pulse: Reduction of lead content

Rotating components of CT systems have to be balanced for quiet operation. 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 Pro.Pulse 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. With this dose can be reduced while image quality is maintained.

Environmental product design

Manufacturing:
From natural resources to operation startup by customer

Use/maintenance:
Includes daily use by our customers as well as maintenance

End-of-life:
From disassembly at the customer site to material and energy recycling

Transportation:
Transports are summarized over the life cycle

Siemens Healthineers considers environmental aspects in all phases of the product life cycle, including material supply, component manufacturing and assembly (which is summarized in manufacturing), use/maintenance, and end of life.

Our product design procedure fulfills the requirements of IEC 60601-1-9:2007+A1:2013 “Environmental product design for medical electrical equipment”.

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

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, Siemens Healthineers is considered one organization and is certified in accordance with ISO 14001 and ISO 45001.

Ecodesign improvements

Siemens Healthineers is committed to contribute to the challenges for a greener and more sustainable world economy by developing new environmentally conscious technologies and concepts, while at the same time improving the clinical value of medical imaging and in-vitro diagnostic devices.

As a member of COCIR[2], Siemens Healthineers has proactively committed to the targets and objectives of the COCIR self-regulatory initiative (SRI) with the European Commission to reduce the environmental impact of medical imaging equipment, following the framework set by the Ecodesign Directive (2009/125/EC).

A strong focus in the last years was on reducing the energy demand of our products. The results of the ecodesign initiative are published by COCIR and regularly reviewed by the EU commission.

Sustainability

Siemens Healthineers respects society around the world. As a globally active company with innovation and investment competency, Siemens Healthineers holds itself to a high standard for sustainable development worldwide and makes a variety of contributions to this development. In addition, Siemens Healthineers is voluntarily and purposefully committed to advancing social issues and meeting needs.

Siemens Healthineers's sustainability performance is consolidated reported in the group-wide Siemens Sustainability Information. The latest report as well as current rating results (e.g., Dow Jones Sustainability Index, Carbon Disclosure Project, Oekom, EcoVadis, MSCI) are available under: **new.siemens.com/global/en/company/sustainability.html**

Green Public Procurement (GPP)[3]

The Green Public Procurement (GPP) initiative within the EU established environmental criteria for certain product categories, including for imaging devices. As it's a focus of Siemens Healthineers to drive energy efficiency and performance criteria for its products we have proactively evaluated the GPP requirements relevant for our imaging products, and have included requirements of GPP in our product development processes.

The relevant criteria addressed with SOMATOM Pro.Pulse include:

- ✓ Chemicals management system
- ✓ User instruction for green performance management
- ✓ Product longevity
- ✓ Training for energy efficiency and optimization
- ✓ Installation with energy efficiency optimization
- ✓ Energy performance

[2] *COCIR = Coordination Committee of the Radiological, Electromedical and Healthcare IT Industry*
[3] *For a description of the EU GPP criteria see: http://ec.europa.eu/environment/gpp/pdf/criteria/health/EN.pdf*

Material compliance

Within the materials compliance program at Siemens Healthineers and with the use of BOMcheck[4] – an industrywide tool pioneered by Siemens – regulated and declarable substances are monitored. Chemicals of concern as listed on the materials declaration standards IEC 62474 and IPC 1752A (including RoHS and REACH substances) are systematically identified to ensure they are not present above permitted threshold limits in our products.

SOMATOM Pro.Pulse conforms with Directive 2011/65/EU of the European Parliament on the restriction of the user of certain hazardous substances in electrical and electronic equipment.

Management of chemicals of concern

Regulated and declarable substances are monitored through the materials compliance program at Siemens Healthineers and through BoMCheck, an industry-wide tool pioneered by Siemens Healthineers. Chemicals of concern (carcinogenic, mutagenic and/or endocrine disrupting) as listed on the materials declaration standards IEC 62474 and IPC 1752A (including RoHS, REACH and California Proposition 65 substances) are systematically identified.

We ensure these substances are not present above permitted threshold limits in our products and/or provide information on how the product can be used in a safe way (e.g., lead for radiation shielding for which no technical and/or environmental sound alternative is available).

We publish the result of our regular analysis based on product ID and part number via **siemens-healthineers.com/reach-svhc-information.pdf**

SOMATOM Pro.Pulse conforms:

RoHS with Directive 2011/65/EU of the European Parliament on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHs)

REACH with EC 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

Calif Prop65 with California Proposition 65 administered by the California Environmental Protection Agency

For developing and placing on the market the following environmentally related standards and laws were taken into account:

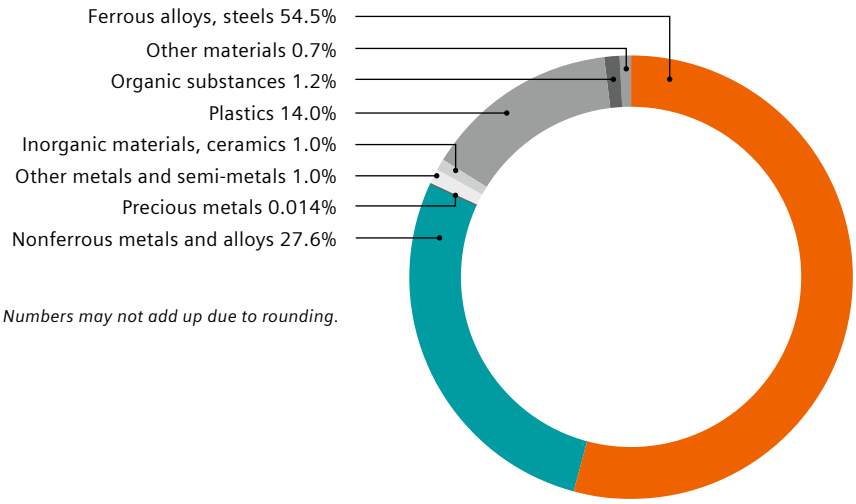
- ISO 14001:2015 (Environmental management system)
- ISO 45001:2018 (Occupational health and safety management system)
- IEC 60601-1-9:2007+A1:2013 (Environmental product design for medical electrical equipment)
- RoHS Directive 2011/65/EU (Restriction of the use of certain hazardous substances in electrical and electronic equipment)
- REACH Regulation EC 1907/2006 (Registration, Evaluation, Authorisation and Restriction of Chemicals)
- California Prop 65 (California Safe Drinking Water and Toxic Enforcement Act of 1986)
- IEC 62474:2018 (Material Declaration for Products of and for the Electrotechnical Industry)
- IPC 1752A (Materials Declaration Management)
- EN50581:2012 and IEC63000:2018 (Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances)
- Ecodesign Directive (2009/ 125/ EC)

[4] *BOMcheck is a web-based declaration and regulatory compliance data base, see www.bomcheck.net.*

Product materials

SOMATOM Pro.Pulse is mainly built out of metals. This ensures a high degree of recyclability.

Total weight: approx. 2250 kg



Numbers may not add up due to rounding.

Packaging materials

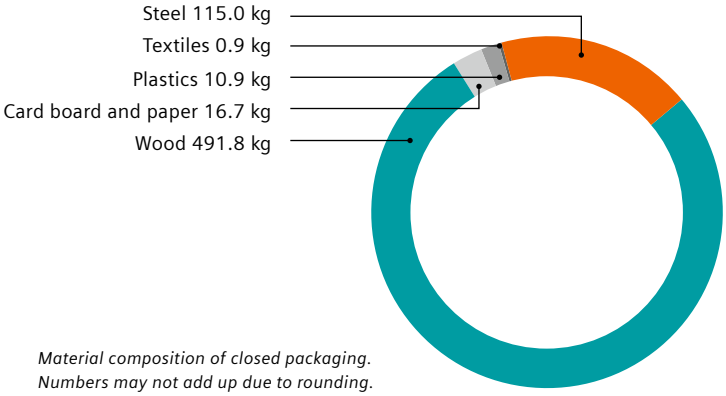
It is our goal to minimize our packaging material and reduce the packaging waste by reusing and recycling it.

The SOMATOM Pro.Pulse system is transported within Europe in open packaging, the CT gantry is only protected by a light dust protective cover. A closed packaging is required for e.g., oversea transports.

The values shown on the chart are average values from the different kinds of packaging types of the SOMATOM Pro.Pulse. The packaging materials consist of almost entirely wood and cardboard all of which can be recycled.

Total weight:

- Open packaging: approx. 466 kg
- Closed packaging: approx. 635 kg



Material composition of closed packaging.
Numbers may not add up due to rounding.

Reduction of critical substances

We made strides to reduce materials in our SOMATOM Pro.Pulse which are environmentally harmful and are not easily recyclable. As a first step we eliminated the usage of lead counter weights and even for radiation shielding, where lead is still commonly used in medical engineering industry, we were able to reduce furtherby substitution with alternative shielding materials.

By all these measures we progressed to achieve a rate of recyclable substances in the SOMATOM Pro.Pulse of 98%, while the remaining 2% can be completely used for thermal energy recovery.

Sustainable use of rare earth metals

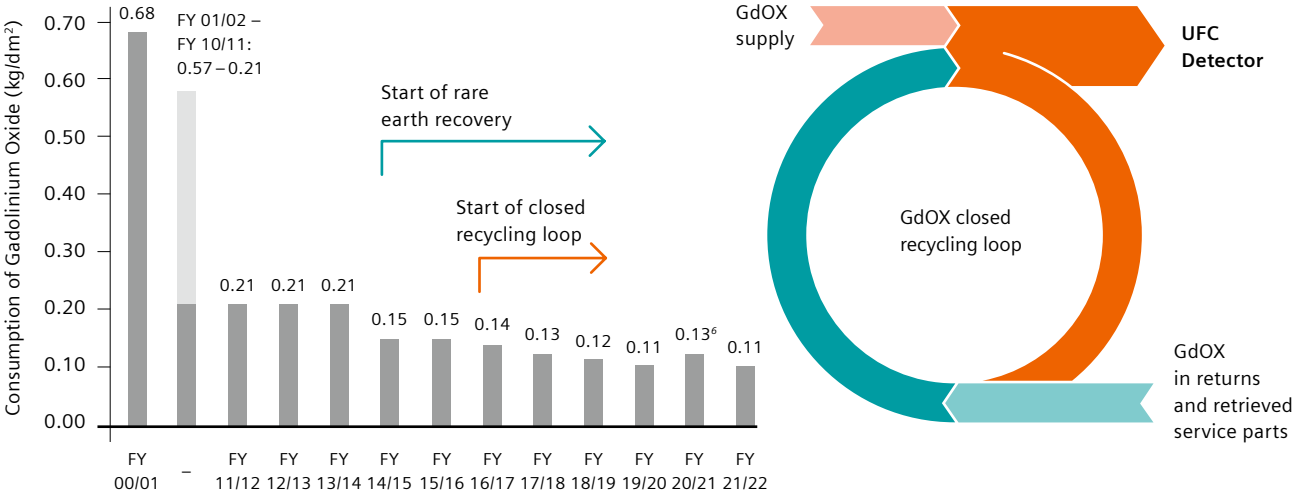
The consumption of rare earth material per unit area for CT detectors was reduced significantly. In fiscal year (FY) 18/19 we were able to reduce the supplied gadolinium oxide for production of a defined surface area of CT detector ceramics (UFC) by 84% in comparison to FY 00/01.

This is due to continuous improvements in our manufacturing technologies and processes.

Especially our measures in rare earth recovery which started in FY15 allowed for a further reduction. This could be even enhanced by introducing a closed recycling loop for the gadolinium oxide processing, which is unique in CT detector manufacturing worldwide.

Today, about 25%[5] of the annually processed gadolinium oxide is utilized out of this closed and sustainable recycling loop.

Reduction of virgin Gadolinium Oxide for production of CT detector ceramics



Product take back

The high-performance X-ray tube assemblies are designed the way that as many parts as possible may be reused. At the end of life the tube assemblies are taken back and refurbished in compliance to standard IEC 62309. Under optimal conditions up to 40% of a tube assembly may consist of reused parts.

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.

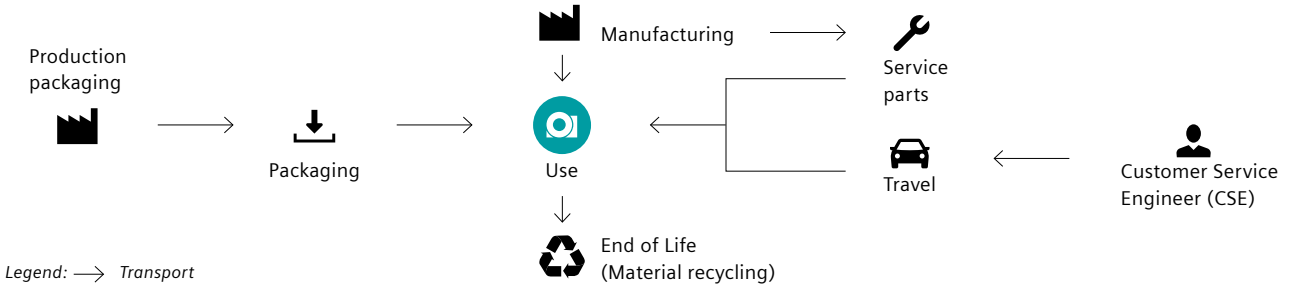
We reuse components and subsystems for non-medical products. We also recycle for material or energy value. Disassembly instructions for disposal and recycling are available for our products.

[5] *Data on file*
[6] *COVID-19, problems on side of recycling service provider*

Life Cycle Assessment (LCA)

In order to optimize environmental aspects of our products over all life cycle phases Siemens Healthineers performs Life Cycle Assessments. We perform LCAs according to ISO 14040/14044, following the recommendations of the ILCD (International Reference Life Cycle Data System) handbook.

The defined scope of the LCA



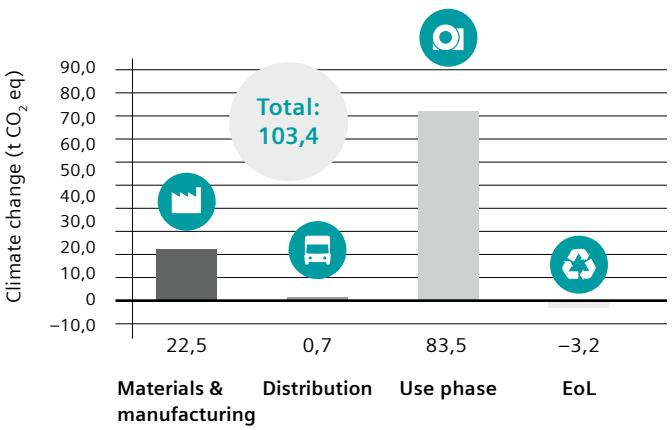
The overall life cycle is structured into four stages. The **Materials and manufacturing** covers material supply, component manufacturing, system assembly and packaging. The **Distribution** covers the product's distribution to the customer, where 1000 km by truck are assumed. The **Usage** is modelled according the COCIR SRI use scenario with 260 working days per year and covers maintenance activities. For **End of Life (EoL)** the SOMATOM Pro.Pulse is disassembled and sorted into fractions with specific material recycling. All other **transport** processes except distribution are assigned to and included to the specific phase where they occur.

Key environmental performance indicators

The impact categories are calculated with Environmental Footprint (EF) 3.1 methodology in the GaBi LCA tool (content version 2023.1). Primary data for electrical energy consumption during usage have been modelled based on Electricity grid mix of Germany.

Impact category	Unit	Materials & manufacturing	Distribution	Usage	EoL
EF 3.1 Acidification	Mole of H+ eq.	1,19E+02	9,58E−01	3,11E+02	−3,84E+01
EF 3.1 Climate Change – total	kg CO_2 eq.	2,25E+04	6,94E+02	8,35E+04	−3,18E+03
EF 3.1 Climate Change, biogenic	kg CO_2 eq.	5,41E+01	2,43E−01	2,66E+01	−3,42E+00
EF 3.1 Climate Change, fossil	kg CO_2 eq.	2,24E+04	6,94E+02	8,34E+04	−3,17E+03
EF 3.1 Climate Change, land use and land use change	kg CO_2 eq.	1,16E+01	1,92E−02	5,08E+01	−3,51E+00
EF 3.1 Ecotoxicity, freshwater – total	CTUe	1,40E+05	1,20E+04	1,84E+05	−2,34E+03
EF 3.1 Eutrophication, freshwater	kg P eq.	5,75E−02	8,94E−05	6,00E−02	−2,89E−03
EF 3.1 Eutrophication, marine	kg N eq.	2,85E+01	3,33E−01	6,40E+01	−3,94E+00
EF 3.1 Eutrophication, terrestrial	Mole of N eq.	3,09E+02	3,74E+00	6,98E+02	−4,25E+01
EF 3.1 Human toxicity, cancer – total	CTUh	2,48E−04	1,88E−07	9,57E−05	−4,42E−06
EF 3.1 Human toxicity, non-cancer – total	CTUh	3,44E−04	3,61E−06	3,89E−04	−4,37E−05
EF 3.1 Ionising radiation, human health	kBq U235 eq.	1,12E+03	2,46E−01	1,60E+03	−4,18E+02
EF 3.1 Land use	Pt	2,48E+05	2,08E+01	1,29E+05	−1,35E+04
EF 3.1 Ozone depletion	kg CFC-11 eq.	1,41E−07	4,20E−11	5,51E−07	−3,62E−09
EF 3.1 Particulate matter	Disease incidences	1,46E−03	6,99E−06	4,11E−03	−3,67E−04
EF 3.1 Photochemical ozone formation, human health	kg NMVOC eq.	8,30E+01	8,49E−01	1,91E+02	−1,31E+01
EF 3.1 Resource use, fossils	MJ	3,01E+05	9,98E+03	9,11E+05	−4,28E+04
EF 3.1 Resource use, mineral and metals	kg Sb eq.	1,54E+00	4,63E−06	9,17E−01	−2,10E+00
EF 3.1 Water use	m^3 worl eq.	3,67E+03	3,13E+00	2,50E+04	−9,83E+02

Climate change – total [t CO_2 eq.]



This chart shows the overall impact of the product on climate change. The use phase is the lifecycle phase with the biggest impact. Different operating conditions can lead to deviations from the reference scenario.

Sustainability in the supply chain

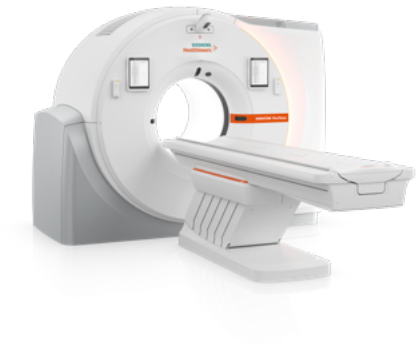
Purchased products and services account for almost half the value of our total revenue. As our suppliers play a critical role in our sustainability-oriented value chain, Siemens[7] expects them also to demonstrate their commitment towards these standards and principles which are summarized in the Code of Conduct.

Code of Conduct is based to a great extent on the principles of the UN Global Compact relating to human rights, labor standards, environmental protection and anticorruption initiatives. These principles are derived from the Universal Declaration of Human Rights, the Declaration on Fundamental Principles and Rights at Work of the International Labor Organization (ILO) and the principles of the Rio Declaration on Environment and Development.

We ensure sustainability in the supply chain with various programs, such as:

- **External sustainability audits**
  External sustainability audits are extensive on-site inspections to check generally accepted sustainability standards. They are conducted on a risk-based approach by external specialists. The audits refer solely to the supplier's conformance and performance in relation to the six categories of the Code of Conduct for Siemens[7] Suppliers. The assessments will be further tailored to the type of facility under assessment and only relevant sections are covered.
- **Responsible minerals sourcing initiative**
  We have rolled out a uniform and enterprise-wide process to determine the use, source and origin of the relevant minerals in our supply chain ("Supply Chain Due Diligence") including "Responsible Minerals Assurance Process" (RMAP) as part of the "Responsible Minerals Initiative" (former "Conflict Free Sourcing Initiative"). We work closely with our direct suppliers to support us in carrying out these steps.

[7] *As part of Siemens AG Siemens Healthineers is following the Siemens requirements.*



Operating data

Heat emissions of the device • 3kW in standby • 11kW in full utilization	
Allowed ambient temperature[8]	18°C–30°C
Allowed relative humidity	20–75%
Noise level[8]	≤ 70 dB in peak load
Power consumption • Basic load[9] • Full load[10] • Maximum load	 ≤ 2.8 kW ~ 20 kW ≤ 200 kVA
Power-on time[11]	< 4 min
Power-off time[12]	< 2 min

Technical specifications

Interface for heat recovery	Yes
Possible type of cooling	Standard: air/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

Power consumption according to COCIR and GPP

Use scenario 24-hour power consumption	
Off	33.3 kWh
Low Power	34.6 kWh
Idle (stand-by)	65.7 kWh

Radiation

Measures/techniques to minimize Ionizing radiation exposure

- Stellar detectors and iterative reconstruction create excellent image quality with reduced noise.
- Tin Filter allows to lower the dose whilst maintaining image quality for non-contrast examinations
- Athlon® DS X-ray tubes enable low-dose scanning thanks to 10 kV steps and reduce scan time for all types of examinations
- CARE kV allows a precise user independent kV selection
- Superfast scanning with a full rotation in only 0.33 seconds

[8] *Within examination room*
[9] *Device is in operation but no patient examination takes place*
[10] *Average value at examination of patients (abdomen routine mode)*
[11] *From off-mode to operating state*
[12] *From operating state to off-mode*

Electromagnetic fields

Measures/techniques to minimize the exposure to electromagnetic fields: Not applicable

Reduction compared to the limit value for users: Not applicable

Replacement parts and consumables

Item	Life cycle[13]
• X-ray tube	1 year warranty[14]
• UPS-battery	24 months

Disposal/substance information

End-of-life concept	Yes
Recycling information	Yes
List of hazardous substances	Yes

Cleaning

Incompatible cleaning processes:
Total device

- Sprays
- Abrasive cleaners
- Organic solvents such as acetone, stain removers, or petroleum spirits
- Products that release ammonia. Ammonia has a corrosive effect.
- Products that contain silicone. Silicone decays over time and can form sticky deposits that interfere with electrical contacts.
- Disinfectants containing hypochlorites

Restrictions for particular device components

- Not applicable

Suitability of device for sterile areas	Not applicable
Size of the surface to be cleaned[15]	Approx. 3 m^2

Please refer to the dedicated operator manuals for system and components for a detailed list of approved and not approved cleaning substances and further instructions.

Further ecologically relevant information

Elements of instructions are:

- Recommendations for saving energy: Yes
- Recommendations for efficient cleaning: Not applicable
- Recommendations for appropriate use of consumables: Yes

[13] *Recommended exchange interval*
[14] *Average replacement varies form system to system as it depends on tube usage and the type of performed procedures*
[15] *Gantry-tunnel (inside), patient table overlay, control elements, console, keypad, intercom, mouse*

Due to certain regional limitations of sales rights and service availability, we cannot guarantee that all products/services/features included in this brochure are available globally through the Siemens sales organization. Availability and packaging may vary by country and is subject to change without prior notice. Some/All of the features and products described herein may not be available in the United States.

The information in this document contains general technical descriptions of specifications and options as well as standard and optional features which may not always be present in individual cases.

Siemens Healthineers reserves the right to modify the design, packaging, specifications and options described herein without prior notice. Please contact your local Siemens Healthineers sales representative for the most current information.

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The statements by Siemens Healthineers' customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption) the results shown in this brochure are not a guarantee that other customers will achieve the same results.

Not for distribution or use in countries that issue country-specific environmental product declarations. Please check with your local Siemens Healthineers representative if there is a country-specific version of this environmental product declaration.

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Published by Siemens Healthineers AG · online · 15522 0924 ·