SIEMENS

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# SOMATOM Definition AS Open 20/64

## CT Excellence for Radiation Therapy

Answers for life.

# Multiply chances.

**Where imaging excellence meets RT expertise.**

In cancer treatment, nothing counts more than a life saved. And everything calls for increasing each patient's chances. That's where we can help. As radiation therapy techniques are rapidly evolving, high-resolution and high contrast imaging is becoming even more important. Our state-of-the art imaging solutions lay the foundations for fully utilizing today's advancements in cancer care. They integrate in your departmental workflow and give you the precision and confidence that you want for your patients.

**This is much more than creating synergies.**
**It's multiplying chances – for life.**

# Which CT provides excellent image quality and lowers my patient's dose?

SOMATOM Definition AS Open is the Siemens CT for the radiotherapy workflow

## SOMATOM Definition AS Open – a world-class CT dedicated for radiation therapy

**Superior image quality** is the sound foundation for precise contouring and accurate radiotherapy treatment planning. Computed Tomography is the first-choice diagnostic imaging method – supported by PET•CT and MR – and the basis for sustainable treatment planning in radiation therapy.

The SOMATOM® Definition AS Open is a **high-end CT system** that efficiently covers both diagnostic radiology and radiation therapy needs. It provides cutting-edge CT technology and **crystal-clear image quality** that shows even very small details. And thanks to the **high-speed acquisition**, motion artifacts can be prevented.

In addition, with the SOMATOM Definition AS Open you acquire images with minimized dose for every patient and every examination. The **simplified CT handling** allows for reliable imaging outcomes – meaning you benefit from excellent clinical image quality with significantly less resources bound to the CT. The scanner has been specially designed to support you in radiation oncology, from planning to follow-up.

And as your CT comes from the **number one in diagnostic imaging**, you can be sure you share in Siemens' constant innovation process – and you stay on the technological cutting edge for the years to come. Enter the world of SOMATOM Definition AS Open – and meet the CT that will excite you.

# SOMATOM Definition AS

## CT Excellence for Radiation Therapy

# Open 20/64


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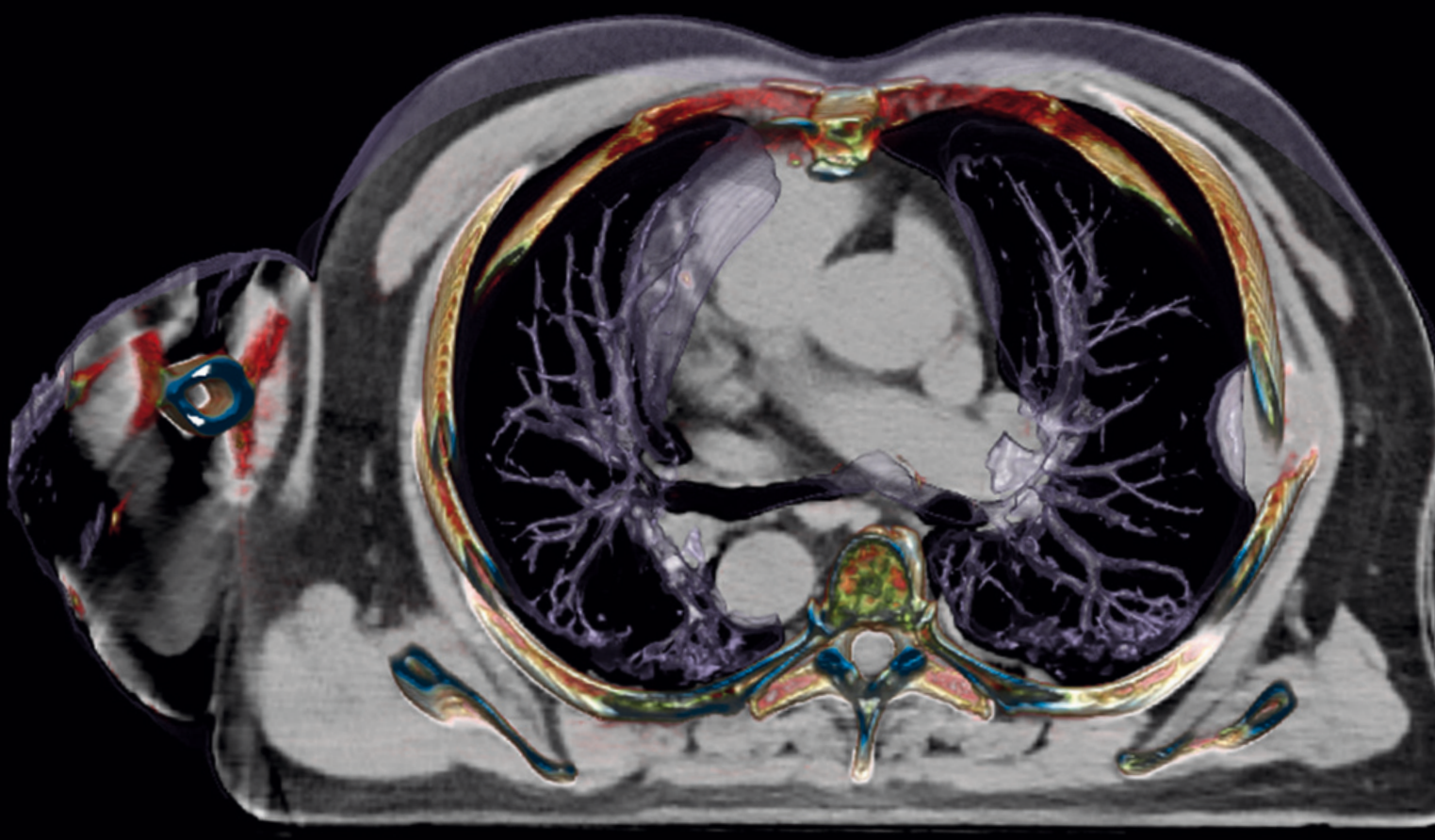
Focused on the economical success of your institution.


| Technical Details | |
|---|---|
| **Slices** | 20 or 64* (acquired slices); 60 or 192* (reconstructed slices) |
| **Rotation speed** | 0.5/1 s / rotation (0.33 s/rotation optional) |
| **Temporal resolution** | 250 ms (165 ms optional) |
| **Min. voxel size** | 0.4 mm (0.33 mm optional) |
| **Bore diameter** | 80 cm |
| **Tube heat capacity** | 50 MHU (0.6 MHU capacity combined with 7.3 MHU/min (5,400 kJ/min) cooling rate is comparable to the performance of a conventional tube with approximately 50 MHU (37,000 kJ) anode heat storage capacity) |
| **Tube cooling rate** | 7.3 MHU/min |
| **Generator power** | 80 kW (100 kW optional) |
| **Table load** | 227 kg (500 lb) for obese patients (300 kg/661 lb optional) |
| **Table deflection** | < 5 mm** |
| **Recon. Field-of-View** | 5 – 50 cm, 65 cm HD FOV, 80 cm eFOV |
| **Min. room size** | 18 sqm (24 sqm incl. control/equipment room) |
| **Cooling** | air/water |
| **Reconstruction speed** | 20/40 images/s (50 images/s optional) |

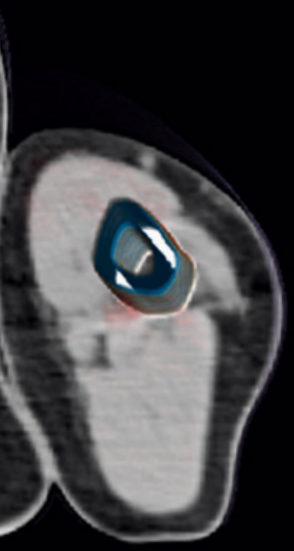
*option
**AAPM-TG-66 guidelines specify < 5 mm in range of 90 cm in z-axis with a patient load of 135 kg

# When imaging



**Courtesy:**
Allgemeen Ziekenhuis Turnhout, Belgium

# guides therapy,
## superior image quality is key.



“We were very pleased with the installation of the SOMATOM Definition AS Open.

For the patients, there is a gain in terms of convenience and time.

The system delivers high-quality images at a reduced radiation dose.”

**Dr. Michael Martens,**
Allgemeen Ziekenhuis Turnhout, Belgium

# Image quality @ low dose

**At every step of your radiotherapy workflow, you rely on clear image quality. As the number of CT images taken is rising in radiation oncology, saving unnecessary dose is of utmost importance. The SOMATOM Definition AS Open reduces dose to the lowest possible level while still providing excellent image quality.**

## Excellent image quality for radiation therapy

The current trend in radiation therapy is to increase the percentage of curative treatments by reducing the margins around a tumor. Having clear tissue differentiations is necessary for fast, easy, and reproducible contouring. The superior image quality of SOMATOM Definition AS Open lets you see the decisive millimeter on every scan. Knowing exactly the size, contour, and volume of the target, you can provide your patient with highly precisely planned radiotherapy treatment – sparing as much healthy tissue as possible.

## STRATON tube – a paradigm shift in X-ray tube technology

The revolutionary design of Siemens' unique and renowned STRATON® X-ray tube enables direct oil-cooling of the anode. This eliminates the need for heat storage and permits the industry's highest cooling rate of 7.3 MHU/min. Your advantage: no cooling delays or warm ups before scanning, for better use of your and your patient's time. The virtually unlimited power reserves of the generator guarantees 80/100 kV imaging without mA limitations, enhancing soft tissue contrast while reducing dose.

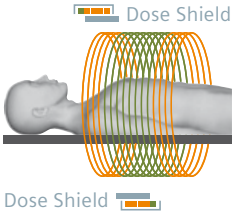
## Saving dose, a Siemens philosophy

Multiple CT examinations during the treatment cycle help to adapt treatment to current changes in anatomy and to check early therapy response. The SOMATOM Definition AS Open provides unique dose-saving features, so you can scan your patients with minimum dose. These features are results of Siemens' strong commitment to save unnecessary dose: our CARE (Combined Applications to Reduce Exposure) initiative strives to find new ways to continuously reduce dose without compromising image quality.

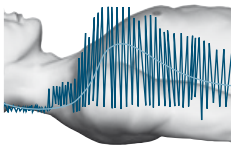
Excellent image quality for precise treatment – SOMATOM Definition AS Open provides the technical features needed for high resolution, high contrast, and fast scanning without motion artifacts.

**Courtesy:**
Allgemeen Ziekenhuis Turnhout, Belgium

## Dose savings in numbers

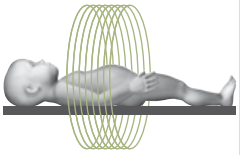



**Adaptive Dose Shield**
up to 25%

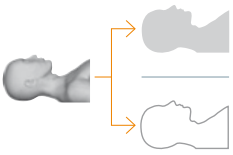


**CARE Dose 4D**
up to 68%

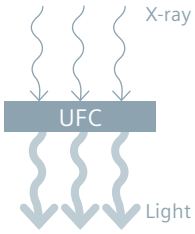
SOMATOM Definition AS Open combines innovative dose-saving features that reduce patient exposure significantly. Saving dose starts right where the image data is acquired: at the Ultra Fast Ceramic (UFC) detector.



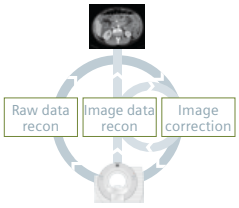
**Pediatric 70/80 kV Protocols**
up to 50%



**4D Noise Reduction**
up to 50%

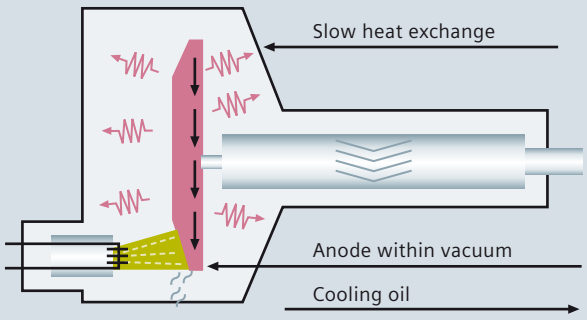



**Ultra Fast Ceramic (UFC) detector**
up to 30%



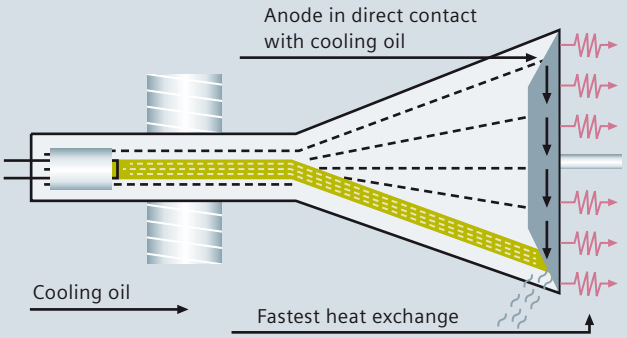

**Sinogram Affirmed Iterative Reconstruction (SAFIRE)**
up to 60%

### Conventional tube design




Conventional anode cools down slowly after exposure

### STRATON tube




STRATON tube never accumulates heat after exposure

# Getting motion under control

**Often it is necessary to see the movement of a target in correlation to the breathing cycle for accurate planning and treatment. The SOMATOM Definition AS Open provides intelligent features and software solutions to visualize tumor movement.**

## Respiratory gating – to easily track a moving target

Respiratory gating introduces time as fourth dimension into your imaging, and therefore into planning and the treatment of moving target volumes.

SOMATOM Definition AS Open enables both prospective and retrospective gating. With its high generator power and the exceptional STRATON tube cooling rate, it has the needed power for long spirals and long examination times – to cover the whole breathing cycle. You can use similar gating devices on your CT and your linac to ensure the highest possible level of accuracy. The Open Gating Interface of SOMATOM Definition AS Open supports several gating systems like ANZAI or RPM®.

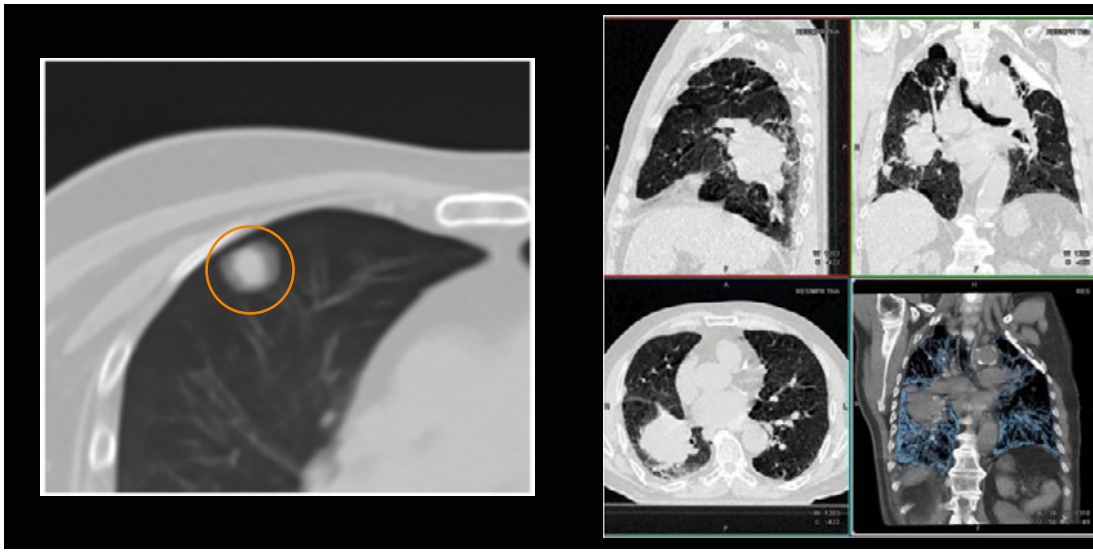
## TSpaceView – to capture a moving target in one image

TSpaceView (AverageCT) is the ideal tool to assess tumor movements. The CT examination is taken with the lowest possible scan speed and pitch of SOMATOM Definition AS Open to show the area where the target is moving during the whole breathing cycle. As TSpaceView sums up data of multiple time points, it visualizes organ motion in one image and in 3D. The image depicts not only the area of movement, but also the probability of presence – and can be produced based on gated and also non-gated acquisitions. TSpaceView thus allows easier contouring of the clinical target volume of moving targets, even without the need for a gated examination – which is, for example, important with patients that breathe irregularly.

## *syngo* TrueD – to assess tumor movement for precise planning

*syngo*® TrueD lets you compare and analyze images you acquired at different time points. The software package allows hybrid image processing: fusing your CT with PET or MR images, you are able to gain both functional and morphological information – for an enhanced contouring.

TSpaceView (AverageCT) is a time-based Multi Planar Reconstruction method and shows the whole organ movement in one CT image as a "tumor cloud".



Furthermore, *syngo* TrueD offers advanced tools for high volume reading. You can clearly visualize even fast moving objects, allowing you to confidently assess tumor movement. Measurement and 4D contouring tools enable highly precise margin calculation.

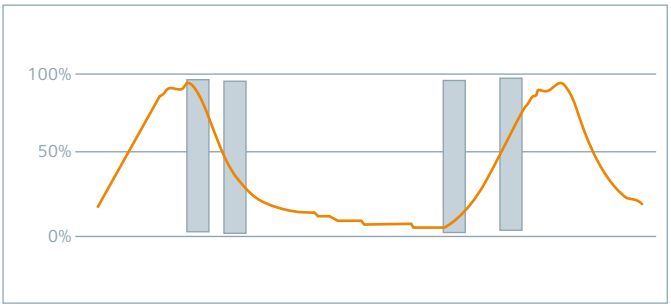
## A CT that fulfills radiotherapy needs

With SOMATOM Definition AS Open, you get the necessary power and performance to get moving targets under control: by providing the outstanding STRATON tube and the generator power needed for 40-60 seconds image acquisition at full power – even for obese patients.

With respiratory gating, you get everything under control – even when it moves.

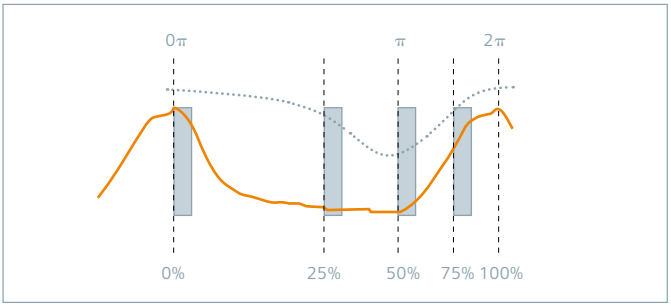
**Courtesy:**
Allgemeen Ziekenhuis
Turnhout, Belgium

### Amplitude-based reconstruction



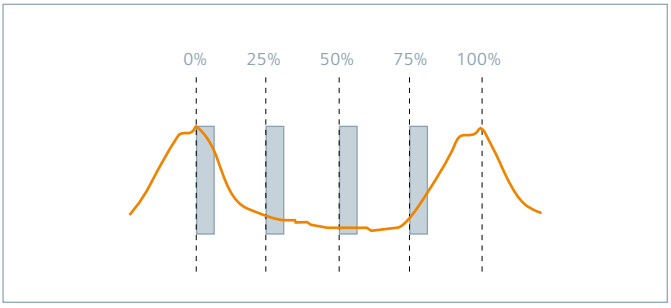

Retrospective gating based on inhalation and exhalation curve (e.g. from ANZAI)

### Phase-based reconstruction



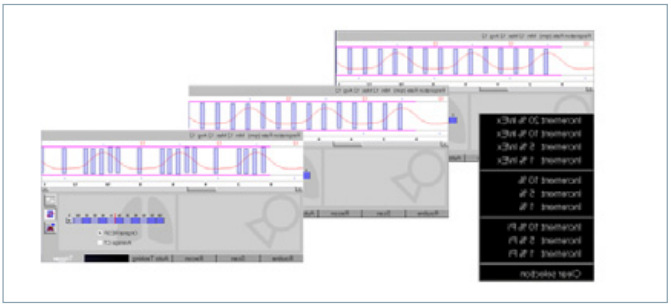

Retrospective gating based on phase information (e.g. Varian RPM)

### Time-based reconstruction




Time-based reconstruction allows a real-time 4D movie

### Multiphase reconstruction



Allows simultaneous reconstruction of multiple phases

# At the push of a button

**Diagnosis, virtual simulation, planning, replanning, and follow-up – a CT plays a decisive role in major workflow steps in radiation oncology. SOMATOM Definition AS Open is an efficient and easy-to-handle solution – that lets you concentrate on your patient.**

## Be FAST – take CARE

SOMATOM Definition AS Open lets you be FAST thanks to its **F**ully **A**ssisted **S**canner **T**echnologies like FAST Planning. By choosing a defined landmark, the CT automatically sets the ideal scan and recon ranges based on the selected body region. This aims not only for a safer, faster, and standardized workflow, but also means that you always get reproducible results.

You can also take better CARE with the **C**ombined **A**pplications to **R**educe **E**xposure. All available dose saving features are always automatically selected when you prepare the CT for a scan – because we also care about your patients.

## Single-click readiness during acquisition

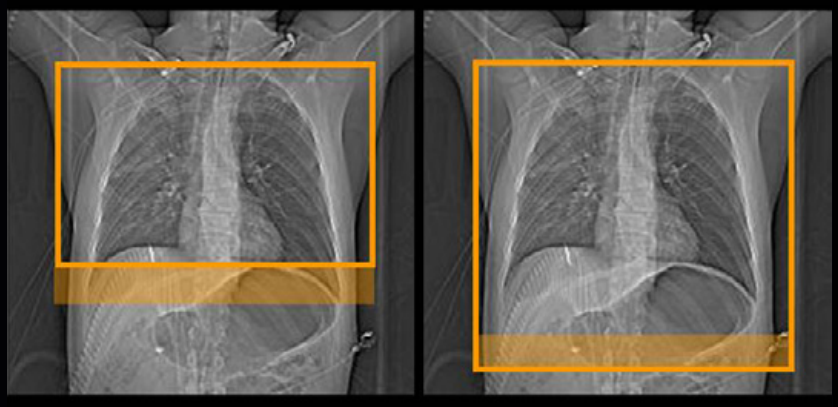
When setting the ranges manually at a CT, organs might be cut off or patients might be over-radiated. SOMATOM Definition AS Open allows for an automated workflow with a single click: this ensures sustainable results in your daily work.

## A second opinion within seconds – with *syngo* Expert-i

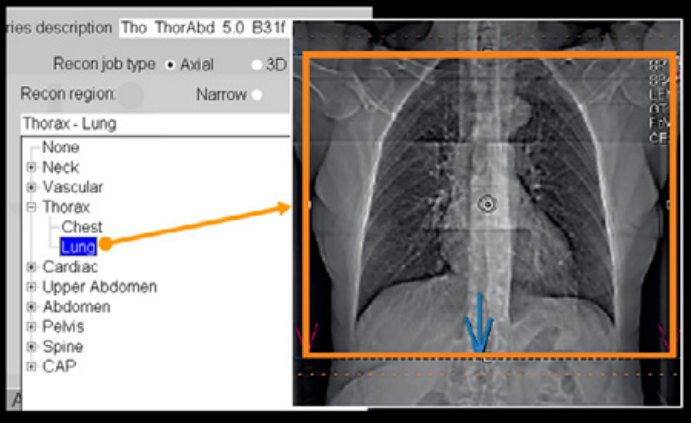
Sometimes it's important to get a quick second opinion from a colleague – whether it's on the weekend or in the middle of the night. With *syngo* Expert-i, clinical staff can easily connect remotely within the clinical network to the CT Acquisition workspace. Thanks to a one screen display and total mouse control within the workstation's user interface, they can even interact with the applications running on the workstation and advise the local user by phone, as if they were actually on site. Thus, questions can be discussed and clarified within minutes.

## *syngo* VSim – virtual simulation tool

We offer an intuitive software for virtual simulation on a workstation next to your CT – *syngo* VSim. With *syngo* VSim, you can optimally prepare a patient's radiation treatment right where you acquired your CT dataset – from tumor localization, reference point management, contouring to beam placement, and virtual simulation. You can



Immediate range selection with FAST




Setting of ranges

interface to external laser systems and simulate treatment with the support of beam's eye view (BEV), room's eye view (REV), multi planar reconstructions (MPRs), and shaded surface displays (SSD). Shift the simulation and verification of beam placements to your CT room and *syngo* VSim – and free up your treatment planning system.

### *syngo*.via – our unique imaging software

Providing an extensive range of the latest oncology-specific applications, *syngo*.via* offers the speed and accuracy needed for oncology reading. *syngo*.via processes images from multiple modalities like CT, MR or PET•CT and displays them side-by-side for an immediate overview. With the *syngo*.via user interface, you have the same look and feel everywhere – further facilitating your clinical routine and streamlining your workflow.

**syngo*.via can be used as a stand-alone device or together with a variety of *syngo*.via-based software options, which are medical devices in their own rights.

# Tailored for RT

**The SOMATOM Definition AS Open is a CT scanner that has been optimized for radiation oncology. It supports precise positioning and reproducible patient setup thanks to a spacious architecture as well as a state-of-the-art, dedicated radiotherapy table top.**

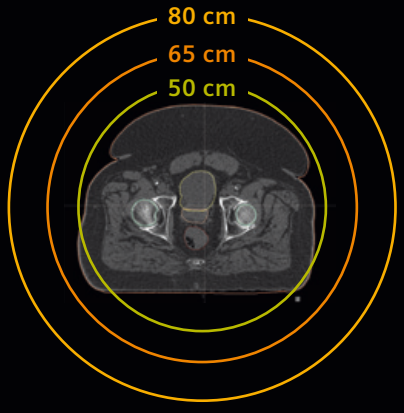
### 80 cm bore – exactly what you need for radiotherapy

An 80 cm bore is the perfect size for radiation oncology. Indeed, the bore of SOMATOM Definition AS Open is spacious enough to accommodate obese patients and patients with positioning aids, such as a breast board, in the correct treatment position without compromising dose. All components are designed to meet the increasing requirement of being able to treat obese patients as well, like a very stiff table with a high maximal table load of 227 kg/507 lb (300 kg/661 lb optional). The combination of the powerful 80 kW (optionally 100 kW) generator and the exceptional STRATON tube cooling rate provides you with the power you need to get crystal-clear images and to acquire gated CT data sets.

### Choosing the right Field-of-View

To achieve sufficient accuracy for highly precise radiation treatment planning, it is sometimes important to visualize areas outside of the regular 50 cm Field-of-View. That is why special reconstruction algorithms have been created to allow visualization using a 65 cm HD Field-of-View or even an 80 cm Extended Field-of-View. Both enable precise radiation therapy planning for obese patients and patients that are positioned off-center. SOMATOM Definition AS Open provides you with the Field-of-View characteristic you need for radiation oncology.

**The right Field-of-View**




**80 cm Extended Field-of-View**
Large enough even for obese patients

**65 cm HD Field-of-View**
The image quality for planning

**50 cm Field-of-View**
Densest image details covering the entire area of interest

The 80 cm bore is large enough to position obese patients comfortably – without compromising dose and image quality

## Dedicated table top – designed for radiotherapy

For precise radiotherapy treatment, accurate patient positioning is crucial. The RTP table top of SOMATOM Definition AS Open has been specifically designed for your needs. With a width of 530 mm and a deflection of less than 5 mm, it is fully compliant with the AAPM TG-66 guideline*. Additionally, a bariatric and a multipurpose table top are available. The system automatically recognizes which table top is mounted, ensuring exact table movement. The RTP table top carries a patient load of up to 227 kg (507 lb), making it ideal for obese patients.

The table offers a universal indexing system for Interlok and Prodigy lock bars to fix the positioning aids. Moreover, you can use identical positioning aids for both the patient RTT table at the CT and at the linac. This helps position your patients always in the same way – whether for the CT scan or for radiotherapy treatment.

## RTP Excellence package – for accurate gantry orientation

Our RTP Excellence package is a special calibration offering for our SOMATOM Definition AS Open in radiation oncology. The high-accuracy installation ensures accurate gantry orientation – and includes:

- Orthogonal alignment of gantry and patient table at highest level (orienting z-direction to scan plane)
- Orienting table plane (around cross(x) direction) to minimize table top deflection
- Orienting table plane (around z-direction) to eliminate lateral deflection of table top, e.g., due to surface unevenness
- Special alignment of gantry lasers with laser adjustment phantom for verification of parallel and orthogonal orientation of scan plane and laser-light planes

*AAPM-TG-66 guidelines specify < 5 mm in range of 90 cm in z-axis with a patient load of 135 kg

Accessories dedicated for radiotherapy

# Ready for the future with options and upgrades

**SOMATOM Definition AS Open fulfills the requirements in radiation oncology, but covers of course all other advanced clinical applications such as perfusion or interventions as well. Innovative features with top clinical performance allow you to maximize the usage of the CT and to be prepared for future needs.**

### Easy upgrade to broaden usage and be ready for the future

The SOMATOM Definition AS Open is a CT scanner that has been designed with the radiotherapy treatment workflow in mind. At the same time, it is also a fully diagnostic CT and you can use the scanner in the radiotherapy configuration for other clinical applications as well. Of course, you can easily upgrade it – for example, from 20 to 64 slices – and use it for a wider clinical spectrum. Increase the application flexibility of your scanner, use it as a backup system for your radiology department or as a specific scanner for bariatric patients.

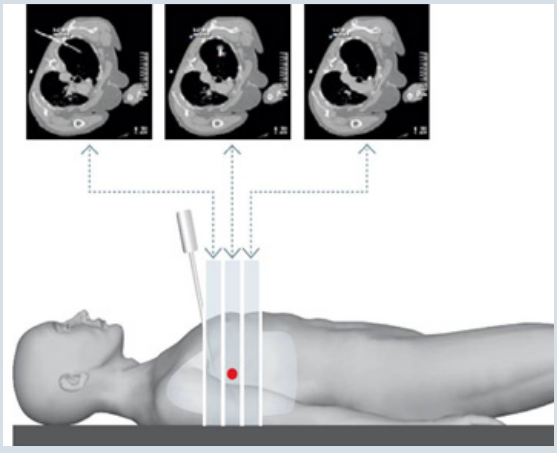
### 3D-guided CT interventions

With conventional CT scanners, CT interventions are difficult to navigate due to restricted 2D axial images and restricted ROI coverage. SOMATOM Definition AS Open enables 3D-guided CT interventions, which makes it ideal for interventional radiology or brachytherapy. Experience 3D guidance virtually in real time. Switch between fluoro, sequence, and spiral scan modes on the fly. Needle tracking and navigation are made easy.

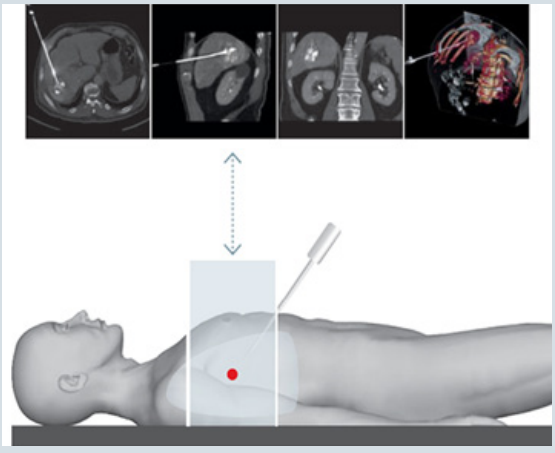
### Volume Perfusion CT

Perfusion is a sensitive indicator of early treatment response, for example in the case of renal cell carcinoma after anti-angiogenic drugs therapy. Thanks to Volume Perfusion CT, SOMATOM Definition AS Open provides you with a composite image showing both anatomical and perfusion information.

Thanks to Advanced Motion Correction, breathing artifacts are eliminated. Adaptive 4D imaging reduces noise and allows reducing the tube current during dynamic acquisition for significant dose reduction. Adaptive 4D Spiral* enables whole tumor coverage.



Conventional CT interventions



3D guided CT interventions



*option


SIEMENS

# A good business decision

**SOMATOM Definition AS Open increases the efficiency of your radiotherapy workflow. And you can rely on our excellent global service offerings.**

### Innovation security

The SOMATOM Definition AS Open is a cutting-edge CT system, from the number one company in diagnostic imaging, that fulfills both radiation therapy and diagnostic radiology requirements. Share our constant innovations in CT. And stay on top of technology for years to come.

### A high level of flexibility

The SOMATOM Definition AS Open offers a high level of flexibility. With a small footprint of only 18 sqm (59 sft) and a compact system design that needs only 24 sqm (78 sft), it fits even into a very small CT suite. And as the scanner can be cooled by either air or water, it easily integrates into your existing infrastructure.

### System reliability – through powerful service

Our comprehensive service offering comprises real-time monitoring, preventive maintenance, hardware and software services as well as application support and training – to ensure optimized system availability, performance, and workflow efficiency. You benefit from:

- **Siemens Remote Services (SRS) –** our IT service infrastructure that links your CT directly to our service experts
- **Guardian Program™ –** pro-active real-time monitoring for your CT, scanning for deviations from current norms
- **Guardian Program incl. TubeGuard –** predicts the majority of all potential CT tube failures, for planned downtimes
- **Virus Protection –** helps protect your CT from every known type of virus, worm or Trojan horse
- **Remote Application Support –** expert support for your CT applications

Our comprehensive service offering lets you enjoy peace of mind – so you can focus on your core business

# Benefits at a glance:

## Leading image quality

Crystal-clear images without motion artifacts, for precise contouring and sustainable radiotherapy treatment

## Low-dose imaging

Unique dose-saving features to scan patients with minimum dose

## Easy to use

Efficient CT acquisition, always with automatically optimized parameters

## Tailored for RT

Reliable and reproducible patient positioning

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