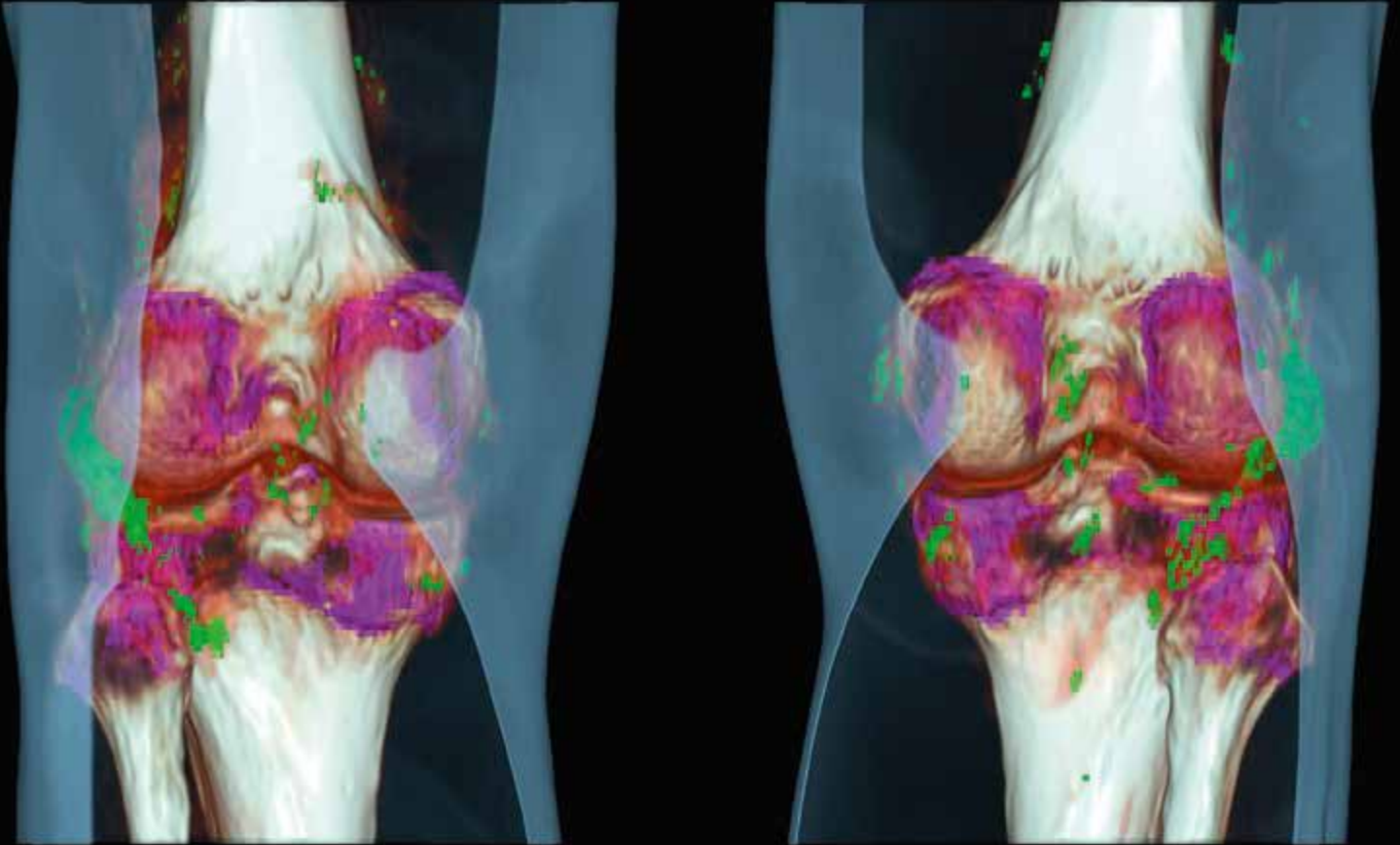


SIEMENS



[www.siemens.com/dual-energy](http://www.siemens.com/dual-energy)

# True Dual Energy with Single Source CT

DEfinitely Siemens

Answers for life.

# Introducing the World of True Dual Energy for Single Source CT

At a glance



SOMATOM® Definition AS: Maximize Outcome. Minimize Dose.

More and more radiologists are relying on Dual Energy for its rich diagnostic range. But what constitutes True Dual Energy?

- Crisp images with even sharper contrast and significant metal artifact reduction.
- No compromise on dose for Dual Energy scans.
- Versatility across many clinical fields.

When you need to highlight, characterize, quantify, and differentiate tissue or other material, don't settle for less. True Dual Energy offers ongoing technological advances from the original pioneer—DEfinitely Siemens.

- DEfinitely excellent images
- DEfinitely the right dose
- DEfinitely versatile

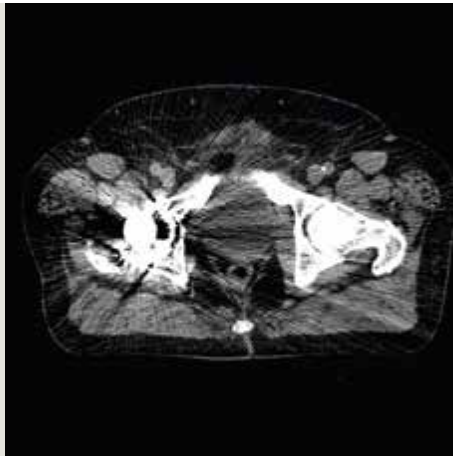


SOMATOM Definition Edge: The Reference in Single Source Dual Energy.

# DEfinitely excellent images



True Dual Energy CT



Conventional CT



True Dual Energy CT

## Clinical benefits

- Crisp image quality.
- Material characterization added to morphology.
- No compromise in image quality with full number of projections.

## Material characterization added to morphology

True Dual Energy CT takes your diagnostic possibilities to a new level. It adds valuable quantitative information to the morphology of a conventional CT scan. For example, the diagnosis of gout is not always simple: in acute cases where the joint is inflamed and painful, aspiration cannot be performed. In addition, uric acid concentration in the blood is not always a reliable indicator. *syngo*<sup>®</sup>.CT DE Gout is both accurate and noninvasive, overcoming these limitations.

## No compromise on image quality

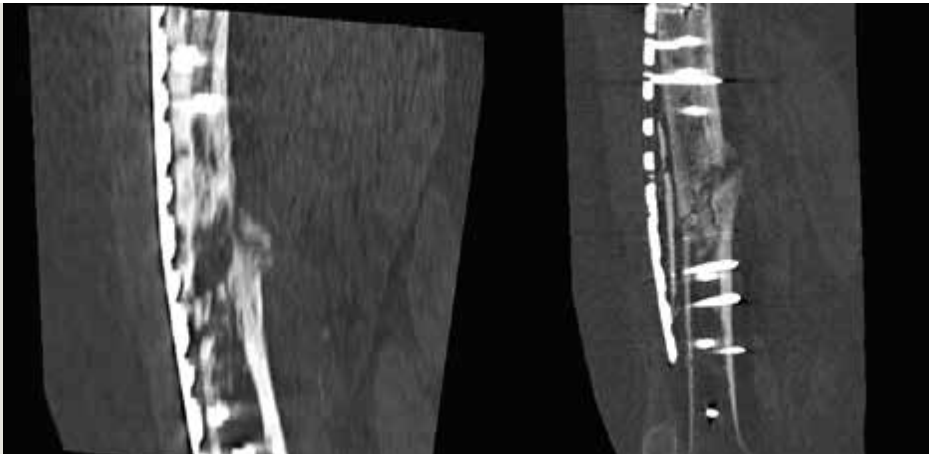
True Dual Energy delivers excellent image quality to enhance your diagnostic certainty. Dual Energy datasets are acquired at high temporal and spatial resolution. Different from others, Siemens' True Dual Energy scan mode for single source CT provides you with the full number of projections for diagnostic image quality.

Monoenergetic Dual Energy images therefore deliver a crisp view of the anatomy—even in complex cases, for example where metal artifacts hinder radiation therapy planning for patients with prostate cancer and hip implants.

## True Dual Energy image quality—easy to achieve

Each step is fine-tuned for ease of use. There are no complicated procedures to set up the scan. It is as easy as setting up a regular spiral scan.

# DEfinitely the right dose



**Conventional CT Scan**  
DLP: 462 mGy cm  
CTDIvol: 23.40 mGy  
→ 0.37 mSv

**SOMATOM Definition Edge**  
DLP: 199/294 mGy cm  
CTDIvol: 8.14/7.95 mGy  
0.16 + 0.23 mSv = 0.39 mSv

## The first dose-optimized Single Source Dual Energy scan mode

The Single Source Dual Energy scan mode consists of two consecutive spiral scans. To avoid doubling the dose, both spirals are performed at approximately half the dose.

No need to compromise either on excellent image quality or the right dose.

## Dose reduction with iterative reconstruction

For an imaging modality to be useful in clinical routine, every opportunity to reduce radiation dose must be taken. Following this philosophy, Siemens has introduced the only Single Source Dual Energy scan mode that uses all dose-reduction functionalities without limitation. This includes SAFIRE\* – the latest dose reduction technique to reduce tube current through iterative reconstruction.

## Real-time dose modulation

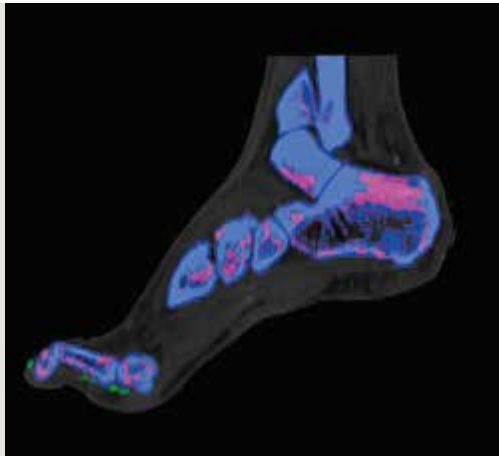
With True Dual Energy for Single Source CT, you can easily find the right dose level to produce the best possible image quality for valuable diagnostic information. CARE Dose4D, for example, provides real-time tube current modulation, offering you all the advantages of Dual Energy imaging without any dose penalty in clear compliance with the ALARA principle.

## Clinical benefits

- No dose penalty with dose-optimized scan mode.
- All dose-saving features available, such as SAFIRE and CARE Dose4D.

\* In clinical practice, the use of SAFIRE may reduce CT patient dose depending on the clinical task, patient size, anatomical location, and clinical practice. A consultation with a radiologist and a physicist should be made to determine the appropriate dose to obtain diagnostic image quality for the particular clinical task. The following test method was used to determine a 54 to 60% dose reduction when using the SAFIRE reconstruction software: Noise, CT numbers, homogeneity, low-contrast resolution, and high-contrast resolution were assessed in a Gammex 438 phantom. Low dose data reconstructed with SAFIRE showed the same image quality compared to full dose data based on this test. Data on file.

# DEfinitely versatile



Gout assessment with  
SOMATOM Definition Edge  
DLP: 63/82 mGy cm  
CTDIvol: 2.65/3.43 mGy  
 $0.05 + 0.7 = 0.75$  mSv

## Clinical benefits

- Dedicated protocols for optimized dose.
- Evaluation software applications for a variety of clinical challenges.

## True Dual Energy for a wide range of clinical questions

Dedicated scan protocols and evaluation software applications allow you to benefit from True Dual Energy for a broad range of diagnostic challenges.

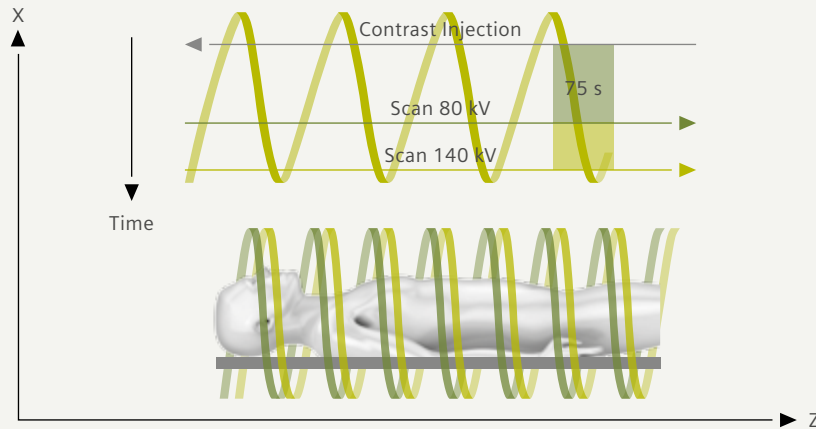
## Customize your image impression—reducing metal artifacts

With *syngo*.CT DE Monoenergetic, you can reduce metal artifacts for the improved results you need. By reducing metal artifacts, the tissues surrounding metal plates or screws can be better visualized. Improved visualization provides a more informed determination of additional clinical actions, such as better understanding when to remove metal implants or improved anatomical visualization for more accurate radiation therapy planning.

## Accurate and noninvasive diagnosis of gout

With *syngo*.CT DE Gout, you can save your patients from painful and stressful examinations and assess uric acid crystals in joints noninvasively.

# Core technologies



Single Source Dual Energy scan mode

## Single Source True Dual Energy scan mode

In a Single Source True Dual Energy scan, two CT datasets are acquired at different kV and mA levels using two consecutive spiral scans. These two spirals are performed automatically and at high temporal and spatial resolution, making Dual Energy as easy as a regular spiral CT scan.

This scan mode is available for the SOMATOM® Definition AS Family and the SOMATOM Definition Edge.

## Contrast-enhanced Single Source Dual Energy acquisition

The quantitative evaluation of lesions requires contrast media-enhanced scans. The Single Source Dual Energy scan protocol for contrast-enhanced studies consists of a contrast media injection followed by the regular scan protocol with a set delay between injection and scan for homogeneous contrast agent distribution.

This scan mode is available for the SOMATOM Definition AS+ and the SOMATOM Definition Edge.

## Robust image registration for reduced motion-artifact images

After the acquisition, the two datasets are registered and processed automatically so that they match perfectly and compensate for motion artifacts, e.g., when patients cannot hold their breath long enough. This all happens without manual user interaction, making the acquisition of excellent Dual Energy images robust and easy in clinical routine.

## Clinical benefits

- True Dual Energy CT as easy as a spiral scan.
- Robust image registration to reduce motion artifacts.
- Dedicated scan protocol for contrast media-enhanced scans.

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