PHILIPS

Computed tomography

Elite
for a reason

Philips iCT family

Outstanding cardiovascular

With advanced cardiovascular imaging capabilities and dramatic benefits of IMR, the iCT family is ready for your most challenging imaging studies. IMR allows for lower dose* with increased image quality and industry-leading low-contrast resolution with virtually noise-free images.

* In clinical practice, the use of IMR 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. Lower image noise, improved spatial resolution, improved low-contrast detectability, and/or dose reduction were tested using Reference Body Protocol. All metrics were tested on phantoms. Dose reduction assessments were performed using 0.8 mm slices, and tested on the MITA CT IQ Phantom (CCT183, The Phantom Laboratory), using human observers. Data on file.

Elite results

The iCT family provides important advances that set you apart, with high image quality at low dose through innovations all along the imaging chain. NanoPanel Elite detectors offer low noise at low energy and low dose. The iDose[4] Premium Package reduces image noise, improves spatial resolution, and prevents artifacts. IMR delivers industry-leading low-contrast imaging. And iCT is powered by the iPatient platform, which puts you in control of innovative workflow solutions and is designed for your demands today and tomorrow.

That's elite performance.

Low energy

Low injected contrast

Low dose

"A huge benefit of using this scanner is that it is so fast and has low-dose capabilities, so we are able to scan extremely sick patients or even children and get amazing images really fast. This has made such a difference."

Director – Collected about Brilliance iCT 256 by KLAS in June 2014
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KLAS®
ACCURATE. HONEST. IMPARTIAL.

Revolutionizing **imaging**

The unique combination of hardware innovations, state-of-the art acquisitions, and IMR – knowledge-based iterative reconstruction – offers you premium results for advanced cardiovascular, pediatric, and time-critical emergency applications.

"The ... iCT ... continues to be one of our best scanners. It is extremely fast; breathing is never an issue. The bore size is excellent, accommodating patients of most any size. We are extremely happy with Philips as a company and with all of their products. Their service and support are excellent. Philips is very attentive to us."

Director
Collected about Brilliance iCT 256 by KLAS in September 2012
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Clinical integration and collaboration	Patient focus	Improved economic value
• Comprehensive cardiac assessment near background radiation levels • Advanced studies made routine • Facilitate delivering appropriate contrast dose with SyncRight injector integration • Expanded patient eligibility	• Sub-mSv coronary CTA for the majority of patients • Chest CT near the dose of a chest X-ray • Low-dose whole organ perfusion • Simultaneous 60–80% lower dose, 43–80% improved low-contrast detectability, and 70–83% lower noise with IMR*	• iPatient helps increase working speed and efficiency, integrating functionality at the point of care • Demonstrated capability to image over 100 vascular patients per day* • Premium performance to drive referrals through excellence in patient-centric imaging • Scalable platform, designed for future innovations

"I have used IMR for several months under various clinical conditions. I believe that IMR changes the face of CT in many ways. It improves the image quality by reducing the noise and increasing low contrast detectability even at lower radiation dose.**"

Emmanuel Coche, MD, PhD, Professor, Head of CT Unit
Department of Medical Imaging, Cliniques Universitaires
St-Luc, Belgium

*Results are specific to the institution where they were obtained and may not reflect the results achievable at other institutions.

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Industry-leading
low-contrast resolution

IMR provides significant improvements in low-contrast detectability, giving you confidence through enhanced visualization. This outstanding improvement helps strengthen the position of CT as the backbone of radiology.

Open new clinical doors

With IMR you can achieve 2.5x to 3.6x improvement in low-contrast detectability.* This opens the doors to the industry-leading low-contrast resolution specification of 2 mm @ 0.3%, measured at a low dose of 10.4 mGy and 7 mm slice thickness.

Lesion detected on CT and confirmed with MR

3T MR **iCT with IMR**

Long associated with MR, this improvement in low-contrast resolution is a breakthrough made possible through the first Philips iterative model reconstruction technique built with a unique knowledge-based approach.

* Low-contrast detectability was assessed using Reference Body Protocol, on the MITA IQ phantom (CCT183, The Phantom Laboratory), using 36 human observers, based on 200 datasets. Data on file.

Lower dose* with increased **image quality**

Managing radiation dose is integral to any radiology practice.
IMR is a breakthrough that allows for significant dose reduction.*

Lower dose* and much more

Even more importantly, IMR allows for lower dose* while simultaneously improving image quality. This balance has not been realized before in Philips CT.

60-80% lower dose* + 43-80% improved LCD* + 70-83% lower noise*

With IMR, you can achieve 60% to 80% lower dose and at the same time improve low-contrast detectability by 43% to 80% and lower noise by 70% to 83% relative to standard (FBP) reconstruction.*

High-quality patient care through low dose*, low contrast, and low noise

IMR allows for lower dose* with lower noise and with improved contrast.

Original study

Standard reconstruction (FBP)
Scan parameters 120 kVp, 249 mAs, 14.6 mGy, 277.4 mGy×cm, 4.2 mSv

Follow-up study

IMR
Scan parameters 120 kVp, 93 mAs, 5.5 mGy, 104.5 mGy×cm, 1.6 mSv
Reconstruction time: 1:32 minutes

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An elite level of CT **imaging**

Keep the “lows” low and your quality high.

Continuing our leadership in meaningful innovations that provide low dose, low energy and low noise with outstanding results, Philips CT is pleased to offer the iCT Elite. The foundation of the iCT Elite is the NanoPanel Elite – Philips second-generation tile detector technology – engineered for low-dose, low-energy, and low-noise imaging.

Elite detector technology

- Reduces image noise at low energy and low dose
- Direct integration technology
- Miniaturization and integration provide low-noise, high-fidelity signal
- Marked image noise improvement

Image noise measured in a 40 cm water phantom at low energy (80 kVp). Introduced in 2007, Philips NanoPanel demonstrated less noise than prior-generation detectors. The NanoPanel Elite continues to set the pace in CT detector technology by demonstrating further improvements in image noise at low energy, an even more impressive accomplishment. This low-noise performance is further enhanced when combined with IMR.

Detector innovation

Philips was first to bring integrated, modular CT tile detector technology to the market in 2007. With thousands of NanoPanel-based systems installed globally, Philips continues to be a leader in CT detector design with the introduction of the NanoPanel Elite – our latest tile detector and a fourth-generation solid-state detector.

1998 2002

Traditional detector technology

2007

NanoPanel
iCT and Ingenuity families

2013

NanoPanel Elite

Driving scan-to-scan **consistency**

iCT workflow powered by iPatient

Philips iPatient is an advanced platform that puts you in control of enhancing your CT system today while getting you ready for the challenges of tomorrow.

Easy and efficient communication between the CT system and injector facilitates the delivery of appropriate contrast dose and consistent image quality.

Focus on the patient

When you're truly in control, new opportunities can emerge. In control means a multitude of ways to facilitate patient-centered imaging. It means that although every day may be different, you're confident the results can be consistent. It's having the knowledge to define what you need in terms of image characteristics, and allows you to adjust the settings automatically.

While you're working to boost return on investment now, you're also accessing a flexible platform that will support future innovations.

iPatient key benefits

- Plan the results, not the acquisition
- Patient-specific methods facilitate optimal* management of image quality and radiation dose
- Up to 24%** faster time-to-results
- Up to 66%** fewer clicks
- SyncRight – facilitates delivering appropriate contrast dose with CT/injector integration
- Enables advanced capabilities such as IMR and future technologies
- Confidence and consistency 24/7 with iPatient

Personalize your control with iPatient and IMR

No two patients are identical, and truly focusing on the patient requires the ability to personalize your control. This means consistently achieving high image quality and managing dose appropriately every day. When iPatient and IMR work together, you have new methods that facilitate patient-specific dose management and increased diagnostic confidence.**

* Optimal refers to the use of strategies and techniques that facilitate the management and control of both image quality and dose.

** In a study done using multiphasic liver CT exams, the iPatient software platform reduced time-to-results by 24% and clicks per exam by 66%. Impact of workflow tools in reducing total exam and user interaction time – four-phase liver computed tomography exams. Nicholas Ardley, Southern Health; Kevin Buchan, Philips Healthcare; Ekta Dharaiya, Philips Healthcare.

Premium **innovation**

At Philips, we understand that the day-to-day aspects of CT require you to do more, in less time, and with low dose, over a wide range of body types, heart rates, and patient conditions. The iCT family is built on Philips best-in-class technologies for the speed, accuracy, and reliability to enhance your workflow on a daily basis.

Quantity	**Tube current modulation** DoseRight, DRI, 3D-DOM **2D Anti-scatter collimator** ClearRay **Detector** NanoPanel Elite **Noise reduction** iDose[4] **Knowledge-based iterative reconstruction** IMR
Quality	**Beam filtration** IntelliBeam
Where	**Beam shape compensation** SmartShape filters **Collimator** Eclipse
When	**Prospective gating** Step & Shoot Complete

"While CT radiation dose is an important issue in modern times, it is equally important to perform a high-quality exam that adequately addresses the clinical issues affecting our patients. Managing the appropriate radiation without compromising the image remains critical."

Scott Logan, MD, MBA, Senior Medical Director of Medical Imaging
Southern Ohio Medical Center, Portsmouth, OH, USA

Award-winning
premium results

Reconstructed in 30 seconds

100 kVp, 100 mAs, 1.1 mSv,
37 cm scan length, 822 images

If it's fast, it's Philips

Majority of reference protocols are reconstructed in under 60 seconds with iDose^4.

The iCT family features the award-winning iDose^4 Premium Package, which includes two leading technologies that can improve image quality: iDose^4 and metal artifact reduction for large orthopedic implants (O-MAR). iDose^4 improves image quality* through artifact prevention and increased spatial resolution at low dose. O-MAR reduces artifacts caused by large orthopedic implants. Together they produce high image quality with reduced artifacts.

Artifacts from large metal objects such as orthopedic implants can be problematic in imaging. These artifacts typically result in loss of anatomical information, impeding visualization of tissue and critical structures. That is why Philips is offering the iDose^4 Premium Package.

* Improved image quality as defined by improvements in spatial resolution and/or noise reduction as measured in phantom studies.

Clinical case study collection

Industry-leading low-contrast resolution with IMR on the iCT – 71-year old man with hemorrhagic lesions not seen on filtered back projection

Scan parameters
120 kVp • 300 mAs • $CTDI_{vol}$ – 14.3 mGy • DLP – 1.8 mGy×cm • Effective dose – 1.8 mSv (k=0.0021*)

Standard reconstruction (FBP)
1 mm slice thickness

Standard reconstruction (FBP)
3 mm slice thickness

IMR
1 mm slice thickness

Whole-organ perfusion with wide-coverage on the iCT, demonstrating penumbra in left hemisphere visualized using the summary maps feature

Scan parameters
80 kVp • 70 mAs • Coverage – 16 cm • iDose⁴ – Level 3 • $CTDI_{vol}$ – 2.7 mGy
Effective dose – 1.8 mSv (k = 0.021*) • Reconstruction time – 12 s

*AAPM Technical Report 96

Lower dose** and increased image quality with IMR on the iCT, lung nodule visualized on the chest CT performed at almost the dose of chest X-ray

Scan parameters

80 kVp • 10 mAs • $CTDI_{vol}$ – 0.2 mGy • DLP – 8.2 mGy×cm • Effective dose – 0.11 mSv (k=0.014*)

Chest X-ray, 0.05 mSv

Chest CT with IMR, 0.11 mSv

Standard Reconstruction (FBP)

IMR

*AAPM Technical Report 96

** In clinical practice, the use of IMR 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. Lower image noise, improved spatial resolution, improved low-contrast detectability, and/or dose reduction, were tested using reference body protocols. All metrics were tested on phantoms. Dose reduction assessments were performed using 0.8 mm slices, and tested on the MITA CT IQ Phantom (CCT183, The Phantom Laboratory), using human observers. Data on file.

First knowledge-based iterative reconstruction for gated studies, demonstrating high-resolution and low-contrast benefits in cardiac CTA

Scan parameters

100 kVp • 110 mAs • $CTDI_{vol}$ – 5.2 mGy • DLP – 67.1 mGy×cm • Effective dose – 0.9 mSv (k=0.014*)

Advanced cardiovascular capabilities of iCT, demonstrating full cardiac assessment below background radiation

Scan parameters

100 kVp • 273 mAs • Collimation – 2 x 128 x 0.625 mm • Coverage – 16.5 cm • iDose[4] – Level 4
$CTDI_{vol}$ – 10.5 mGy • DLP – 223.2 mGy×cm • Effective dose – 3.1 mSv (k = 0.014*) • Reconstruction time – 13 s (165 images)

*AAPM Technical Report 96

Fast scan speed of iCT, demonstrating high-quality low-dose pediatric CTA with high heart rate

Scan parameters
80 kVp • 100 mAs • Collimation – 2 x 128 x 0.625 mm • Coverage – 10.3 cm • iDose^4 – Level 3
$CTDI_{vol}$ (16 cm) – 4.4 mGy • DLP – 45.2 mGy×cm • Effective dose – 1.8 mSv (k = 0.039*)
Reconstruction time – 12 s • Heart rate – 143 bpm

"We have been very impressed with our iCT 256. It has amazing speed, and we are able to get a full heart scan in one beat. We use the iCT 256 for neuro, cardio, and everything in between. It has lived up to expectations."

Director
Collected about Brilliance iCT 256 by KLAS in June 2014
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*AAPM Technical Report 96

Low-energy Step & Shoot capabilities of iCT, demonstrating low injected contrast study

Scan parameters
100 kVp • 140 mAs • Collimation – 2 x 128 x 0.625 mm • Coverage – 65.9 cm • iDose[4] – Level 5
$CTDI_{vol}$ – 8.3 mGy • DLP – 545.3 mGy×cm • Effective dose – 8.2 mSv (k = 0.015*)

"We have been using IMR for routine body imaging, and are extremely excited about the virtually noise-free benefits and anatomical detail. This new technological development provides diagnostic images that help us increase our confidence in making a diagnosis. These significant benefits are likely to help strengthen CT's position as the backbone of radiology."

Barry Daly, MD, FRCR
Professor of Radiology, University of Maryland School of Medicine Chief of Abdominal Imaging and Vice Chair for Research, University of Maryland Medical Center, Baltimore, MD, USA

Low-energy Step & Shoot capabilities of iCT, demonstrating low injected contrast study

Scan parameters

100 kVp • 42 mAs • Collimation – 2 x 64 x 0.625 mm • Coverage – 120.1 cm • iDose[4] – Level 3
$CTDI_{vol}$ – 1.8 mGy • DLP – 228.0 mGy×cm • Effective dose – 3.4 mSv (k = 0.015*) • Reconstruction time – 90 s (1714 images)

*AAPM Technical Report 96

Industry-leading low-contrast resolution with IMR on the iCT, for detection of small and subtle differences

Scan parameters
80 kVp • 500 mAs • $CTDI_{vol}$ – 9.8 mGy • DLP – 170.5 mGy×cm • Effective dose – 2.5 mSv (k=0.015*)
Slice thickness – 0.68 mm

Standard reconstruction (FBP) **IMR**

Dual-energy studies using spin-spin kV switching on the iCT, demonstrating quantitative analysis of iodine enhancement

Scan parameters
80/140 kVp • 460/90 mAs • Collimation – 64 x 0.625 mm • iDose⁴ – Level 4 • $CTDI_{vol}$ – 9.4 x 2 mGy
DLP – 75.2 mGy×cm • Effective dose – 1.1 mSv (k = 0.015*)

*AAPM Technical Report 96

Orthopedic metal artifact reduction on the iCT, revealing structural detail previously obscured by noise and artifacts

Scan parameters
120 kVp • 201 mAs • Collimation – 64 x 0.625 mm • Coverage – 14.7 cm • iDose[4] – Level 4 • O-MAR – On
Focal spot resolution – High • Image matrix – 768 x 768 • $CTDI_{vol}$ – 13.9 mGy
DLP – 204.3 mGy*cm • Effective dose – 2.9 mSv (k = 0.014*)

Orthopedic metal artifact reduction on the iCT, revealing structural detail previously obscured by noise and artifacts

Scan parameters
120 kVp • 380 mAs • Collimation – 128 x 0.625 mm • Coverage – 59 cm • Scan time – 7.6 s
iDose[4] – Level 4 • O-MAR – On • Focal spot resolution – High • Image matrix – 768 x 768

*AAPM Technical Report 96

Advanced applications

The Philips **IntelliSpace Portal** turns virtually any PC into an advanced multimodality imaging systems workspace. Work on advanced visualization in your preferred environment, using patient data without worrying about the modality of origin or moving to a specialized workstation.

Diagnose and collaborate virtually anywhere, anytime

Radiology is the hub of the healthcare facility. Easy clinical workflow and collaboration tools will help you streamline your daily routine. Unlock the power of CT, MR, and Nuclear Medicine systems with rich clinical applications accessible virtually anywhere – home, office, or on the road. Reaching out to referring physicians and specialists is easy with what we like to refer to as our medical networking platform.

Real-time collaboration*

Clinicians can dynamically interact with the images while discussing diagnosis and treatment plans either by phone or live chat, allowing for reduced time to arrive at a clinical decision. This is ideal for conferring with colleagues in trauma situations.

Philips IntelliSpace Portal offers best-in-KLAS technologies for advanced visualization and extracting information from low-dose, high-quality images.**

- **Rich clinical applications:** Unlock the full potential of your imaging systems in order to quickly quantify and diagnose
- **Multimodality access virtually anywhere:** Advanced clinical applications, new workflow, and collaboration tools available virtually anywhere
- **Enhanced ZeroClick preprocessing:** accelerates multimodality imaging analysis for increased diagnostic confidence

*Collaboration enables viewing and sharing – it is not to be used for diagnosis.

**KLAS is an independent, leading research firm with the mission to improve healthcare technology delivery by honestly, accurately, and impartially measuring vendor performance for their provider partners.

We've got you **covered**

The excellent uptime of the iCT family is due in part to proactive monitoring and visual diagnostics, which allow us to address issues quickly for our customers.

Remote means we're close and quick. Philips Remote Services have been engineered to automatically probe your scanner in order to address problems before they occur, help reduce disruption, and keep your workflow on track.

By proactively monitoring the health of your system, a service engineer can arrive at your site with the proper knowledge and parts to help reduce the critical time to repair.

NetForum Community

NetForum is a virtual clinical community where users from around the globe share clinical experiences, learn from peers, and optimize their own results. See our commitment to this mission to expand the clinical effectiveness of diagnostic imaging demonstrated in our online user community: **www.philips.com/netforum**

Spectral ready platform

Featuring first-of-its-kind spectral detector-based CT technology, the Spectral upgrade to your existing iCT allows you to use color within CT images to identify the composition of what you see. Through this quantitative approach, you add spectral resolution to your image quality. So you not only get the anatomical information that you are used to with CT, but also the ability to uncover the characterization of tissue and structures based on material content. This is designed to help you improve your patients' care.

Spectral upgrade allows you to use color

Conventional chest CTA

Spectral results

NanoPanel Prism

NanoPanel Prism

- Low-dose, simultaneous spectral energy separation
- Low noise with Elite electronics
- No sensitivity to afterglow and no dead time

Yttrium-based scintillator

- Optimized for energy separation and with low image noise
- High light output at low energy
- Simultaneous detection in both time and space with negligible intra-layer scatter

Yttrium-based scintillator

On the **SmartPath** with you

We understand how critical it is to elevate quality and efficiency in your daily work routine and we know that no two practices are alike. This is why we developed a customizable premium approach to the iCT family of scanners.

Enhancing the capabilities of your existing iCT family scanners, the SmartPath upgrade offers easy access to knowledge-based iterative reconstruction.

Optimize your system's performance both now and in the future with regular and ongoing updates, including functionality improvements and remote technical support.

Enhance your equipment with regular technology upgrades, and take advantage of the newest features and capabilities.

Transform your investment at the end of your system's life by transitioning seamlessly to a next-generation solution or refurbished option.

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The images and descriptions contained herein provide technical specifications and optional features which may not be included with the standard system configuration. Contact your local Philips Representative for complete specific system details.

Some or all of the products, features, and accessories shown or described herein may not be available in your market. Please contact your local Philips Representative for availability.

The iCT Elite with IMR and iCT Elite are configurations of the iCT.

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