Introducing the
Discovery® CT750 HD FREEdom Edition

The World’s First
Cardiac Spectral CT
The biggest challenges in cardiac CT today are coronary motion, calcium blooming, accurate perfusion, treating patients with high heart rates, and plaque characterization.

Now, GE Healthcare offers a breakthrough that addresses these challenges in a significant way:

The Discovery CT750 HD FREEdom Edition.
Introducing SnapShot Freeze—an intelligent motion correction breakthrough. With SnapShot Freeze, coronary motion can be significantly reduced, transcending the limits of a hardware-only system.

Coronary artery motion is a leading cause of blurry cardiac CTA exams, especially at high heart rates.

SnapShot Freeze can calculate a blood vessel’s motion path and velocity from adjacent cardiac phases and use that information to determine where the vessel will be at the target phase.

Because SnapShot Freeze corrects motion within a single heart cycle, it is not susceptible to beat-to-beat inconsistencies, which can make multi-sector (i.e., multiheart cycle) reconstruction less effective.

**29 msec**
Effective Temporal Resolution

**.058 sec**
Equivalent Gantry Speed

“**The new algorithm SnapShot Freeze is able to improve the temporal resolution very close to invasive coronary angiography. We are now able to remove the motion artifacts that are responsible for a lot of false positive cases.”**

Gianluca Pontone, MD  
Cardiologist and Radiologist at Centro Cardiologico Monzino, IRCCS Milan, Italy
Motion FREEdom with SnapShot Freeze

Conventional

SnapShot Freeze

Curved images of the RCA with conventional (left) and SnapShot Freeze (right).

Curved view of a heavily calcified RCA with motion artifacts (left) and without motion artifacts (right).

Curved images of the RCA with conventional (left) and SnapShot Freeze (right).

Workflow Enhancement with SnapShot Assist

Ready
start timing bolus or practice breath hold

Set
system sets type, pitch thickness, interval

Scan

HD FREEdom Edition SnapShot® Assist combines information about patient heart rate variability and BMI to guide the CT operator to optimal cardiac scan settings. These displayed settings are based on over a decade of GE experience in cardiac CT and can be updated as desired to match a department’s best practices scan protocols.
Calcium FREEdom with GSI Cardiac

The first cardiac spectral CT scanner to merge our pioneering SnapShot technology with fast kV switching.

0.25 msec switching from 80–140 kVp

The Discovery CT750 HD FREEdom edition extends Gemstone Spectral Imaging (GSI) to cardiac scanning and enables virtually simultaneous acquisition between two different energies (80 kVp and 140 kVp) to acquire data less than 0.252 msec apart in time. This data can be used to separate materials and derive monochromatic spectral images using a projection-space reconstruction algorithm.

GSI Cardiac technology surpasses traditional dual source CT techniques by reducing motion mis-registration of data. The registered dual-energy datasets generated in GSI Cardiac scans are used to assess coronary vessels through the material separation of calcium and iodine. Monochromatic spectral energies can also be used to reduce the beam hardening effects of calcification, enabling clinicians to see coronary vessels more clearly.

With GSI, both high and low energy data sets are collected virtually simultaneously to improve image registration for material separation throughout the full 50cm field of view.

“GSI Cardiac produces material separated and monochromatic spectral energy images. These images provide clinicians with the ability to separate materials such as iodine and calcium, as well as changing the energy level (keV) for better delineation of the borders of objects such as calcium.”

James Earls, MD
Fairfax Radiology

† GSI is delivered with a base set of materials from the NIST database and is engineered for the capability to add other materials from this database. Currently, HAP is not included on the scanner/viewer as one of the materials, but can be loaded by the user following instructions in the GSI Viewer User Manual.
Calcium FREEdom with GSI Cardiac

Monochromatic images showing enhanced vessel visualization with reduction in calcium blooming.

Using material density and monochromatic imaging, GSI Cardiac can better separate iodine and calcified plaque at different single keV energies enhancing both the visual and quantitative assessment of calcified plaque in the coronary vessels.

120 kVp image acquired without GSI.

Cross sectional views of LAD vessel with calcified plaque showing the benefit of reduced calcium blooming by adjusting keV levels within a monochromatic image.

† GSI is delivered with a base set of materials from the NIST database and is engineered for the capability to add other materials from this database. Currently, HAP is not included on the scanner/viewer as one of the materials, but can be loaded by the user following instructions in the GSI Viewer User Manual.
Horizon FREE with GSI Cardiac

Enabling accurate CT perfusion measurements: the benefit of Spectral CT.

The challenge of beam hardening effects is amplified in cardiac imaging, as artifacts may mimic myocardial perfusion defects when none are present. This can lead to additional cost and unnecessary follow-up procedures.

GSI Cardiac is designed to reduce beam hardening in the coronary arteries and myocardium, important for accurate perfusion measurements.

GSI Cardiac allows you to quantify the change in iodinated contrast between rest and stress exams.

“CT perfusion has traditionally suffered from image artifacts — noise, beam hardening, and shading artifacts. The shading artifacts in particular can be especially problematic because they’re often nearly indistinguishable from perfusion deficits. GSI Cardiac has the potential to minimize these artifacts, which is important for the diagnostic performance of CT perfusion testing.”

Jonathon Leipsic, MD, FRCP, FSCCT
Vice Chairman of Radiology at University of British Columbia
Vancouver, British Columbia
**Horizon FREE: GSI Cardiac plaque material composition**

GSI Cardiac provides additional information that may allow physicians to assess the material composition of coronary plaque beyond information provided with HU alone.

Scatterplot (b) and spectral attenuation curve (c) show the different material composition of the coronary plaque (a).

**GSI Cardiac with ASiR®**

Get all the benefits of spectral CT—enhanced vessel visualization, beam hardening and accurate myocardial perfusion information with new GSI presets designed to achieve dose neutrality between GSI and single kVp scanning.

GSI Cardiac exam acquired at the same dose as single energy studies per the ERASIR protocol\(^1\) SSPulse GSI-57 (375 mA), BMI=22.5, DLP=94 mGy.cm, 1.3 mSv\(^{-1}\)

---


\(^{†}\) Obtained by EUR-16/62 EN, using an abdomen factor of 0.015*DLP and a pelvis factor of 0.019*DLP
Spectral CT completely integrated to fit your workflow

GSI Viewer 3D — provides fully integrated post-processing of your GSI exam

**Visualization**
Integration in VesselIQ* Xpress and CardIQ Xpress 2.0
Reveal to display monochromatic energies and material separated images.
Leverage routine Volume Viewer capabilities for volume rendering and segmentation.
Save preferred GSI settings to create user defined protocols.

**Access from Anywhere with Dexus**
A comprehensive Dexus solution is available to extend your Discovery CT750 HD FREEdom Edition experience.
Available on AW or AW Server — access Spectral CT images from wherever you are.

Automatic coronary tracking and labeling
Coronary assessment using curved view

Easy access to monochromatic images and material decomposition pairs
The World’s First Cardiac Spectral CT

101 Possible Spectral Images

Material Density Quantification

A New Era of CT Specificity
About GE Healthcare
GE Healthcare provides transformational medical technologies and services that are shaping a new age of patient care. Our broad expertise in medical imaging and information technologies, medical diagnostics, patient monitoring systems, drug discovery, biopharmaceutical manufacturing technologies, performance improvement and performance solutions services help our customers to deliver better care to more people around the world at a lower cost. In addition, we partner with healthcare leaders, striving to leverage the global policy change necessary to implement a successful shift to sustainable healthcare systems.

Our “healthymagination” vision for the future invites the world to join us on our journey as we continuously develop innovations focused on reducing costs, increasing access and improving quality around the world. Headquartered in the United Kingdom, GE Healthcare is a unit of General Electric Company (NYSE: GE). Worldwide, GE Healthcare employees are committed to serving healthcare professionals and their patients in more than 100 countries. For more information about GE Healthcare, visit our website at www.gehealthcare.com.

GE Healthcare
3000 North Grandview
Waukesha, WI 53188
USA