A photograph of a Siemens Biograph Horizon PET scanner. The image shows the large, circular gantry of the scanner, which is white and metallic. The gantry is open, revealing the interior. On the right side of the gantry, there are two circular control panels with various buttons and a red emergency stop button. The text "Biograph Horizon" is visible on the right side of the gantry. The Siemens logo is in the top left corner. The background is a plain, light-colored wall.

SIEMENS

Biograph Horizon

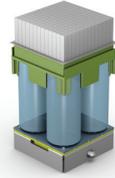
Biograph Horizon

[siemens.com/biograph-horizon](https://www.siemens.com/biograph-horizon)

Biograph Horizon

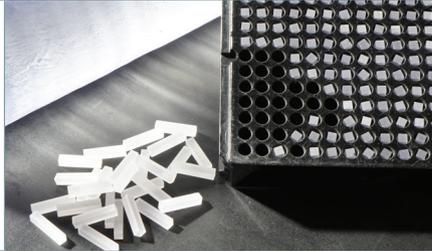
Technology highlights

OptisoHD LSO detectors



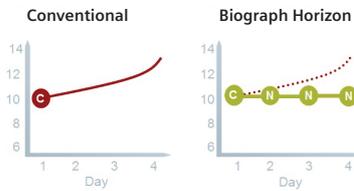
Siemens is the only company to own its entire detector production chain, from crystal growth to detector assembly. Siemens scanners feature LSO, which is the scintillator of choice for PET imaging. With high light output and fast decay time, LSO provides high-quality images with low noise and enables Time-of-Flight.

4 mm crystal elements



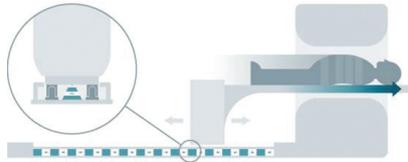
The size of the crystal significantly impacts the ability to visualize small lesions: a smaller crystal leads to better spatial resolution. Over 20,000 small LSO elements create the detector array of Biograph Horizon™, providing excellent spatial resolution to help visualize small lesions and aid in making better treatment decisions.

QuantiQC



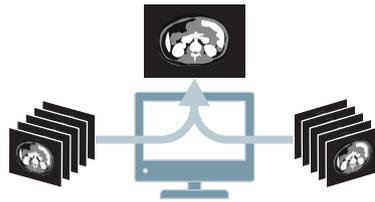
Eleven calibration and normalization procedures can be performed automatically every day and overnight, delivering consistent performance over time and reproducible quantitative values, which saves time and manual interaction.

SMART PHS



With its unique design, Siemens Molecular & Anatomical Registration Technologies (SMART) patient handling system (PHS) supports patients up to 227 kg (500 lb) and enables acquisition of PET and CT images with zero deflection between both field-of-views for precise registration and accurate quantitative values. SMART PHS is compliant with TG-66 guidelines for radiation therapy.

High-performance reconstruction



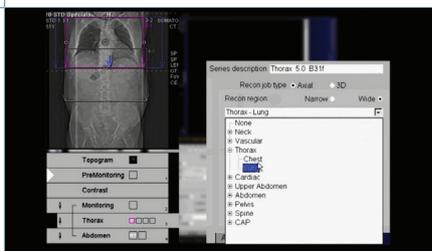
Fast PET acquisitions are supported by a powerful computer system that is capable of reconstructing two datasets simultaneously and delivering images as fast as 30 seconds after the end of the scan.

CARE Dose4D

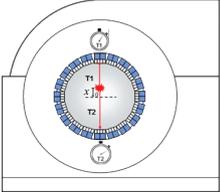
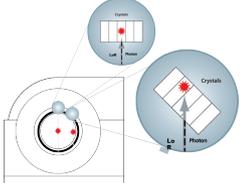
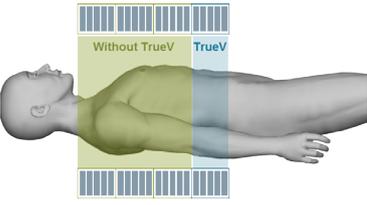
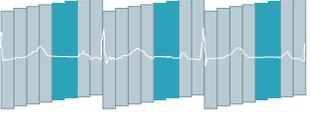
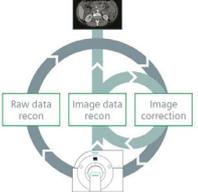
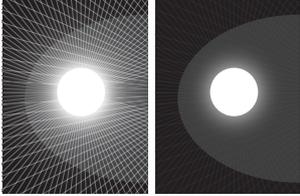
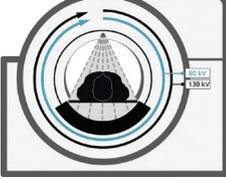
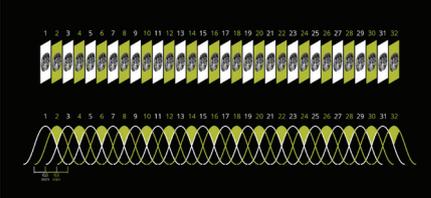


Radiation dose management is a concern today for patients, medical professionals and Siemens alike. Automated, real-time current modulation of the CT tube delivers the right dose for every anatomical region without compromising image quality. CARE Dose4D™ is part of the “Take CARE” technologies and one of the elements that make Biograph Horizon compliant with NEMA XR-29 guidelines.

FAST Planning



Automated selection of scan and reconstruction ranges of CT images based on anatomical landmarks facilitates a fast and standardized CT workflow. FAST Planning is part of the “Be FAST” technologies that optimize process efficiency making time-consuming and complex procedures faster and more intuitive.

<p>Time-of-Flight</p>		<p>By measuring the actual time difference between the detection of each coincidence photon, Time-of-Flight (TOF) can localize the event within a small range along each line of response (LOR). This increases signal-to-noise ratio by up to 200%, enabling faster scans, lower injected dose and improved image quality.</p>
<p>HD•PET</p>		<p>HD•PET incorporates measured point spread functions (PSF) into the iterative reconstruction algorithm. Through modeling of the PSF, HD•PET more precisely accounts for the positioning of the LOR, yielding visually sharper clinical images compared to conventional reconstructions.</p>
<p>TrueV</p>		<p>TrueV offers an additional PET detector ring that increases the axial field of view by 33% to enable two-times faster scans or half the injected dose, as well as more coverage, without compromising image quality.</p>
<p>Respiratory and cardiac gating</p>		<p>Gated acquisition generates time-tagged, continuous count data over predefined intervals. With gated acquisition, cardiac and respiratory motion can be reduced for improved image quality. Gating signals can be provided by external ECG or respiratory monitoring devices, such as those from Anzai or Varian.</p>
<p>SAFIRE</p>		<p>SAFIRE reduces image noise without loss of image quality or detail visualization by introducing multiple iteration steps in the raw-data in the reconstruction process. The result is a superior image quality or up to 60%** dose reduction in routine clinical use.</p>
<p>iMAR</p>		<p>iMAR reduces metal artifacts, while maintaining valuable patient data, to support outstanding image quality even for challenging cases like spine implants, pacemakers, dental fillings and neuro coils. iMAR can be especially helpful when imaging patients for radiation therapy planning.</p>
<p>Dual-energy CT</p>		<p>Add tissue characterization to CT images with the acquisition of two spiral datasets in sequence at different energies and at about half the dose each. Registration is fully automated with FAST DE Results, generating dual-energy datasets for monoenergetic viewing at the acquisition workplace or other reading environment.</p>
<p>32-slice reconstruction (IVR)</p>		<p>Improve the spatial resolution in z-direction by reconstructing 32 slices for all spiral scans independent of pitch. Interleaved Volume Reconstruction (IVR) uses the measured data as efficiently as possible by reconstructing 32 overlapping slices from the acquired 16-slice data.</p>

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Order No. A91MI-10430-1C-7600 | Printed in USA | MI-2802.KF.JV.TW.3000 | © Siemens Healthcare GmbH, 03.2016

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*Biograph Horizon is not commercially available in all countries. Due to regulatory reasons, its future availability cannot be guaranteed. Please contact your local Siemens organization for further details.

**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.

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