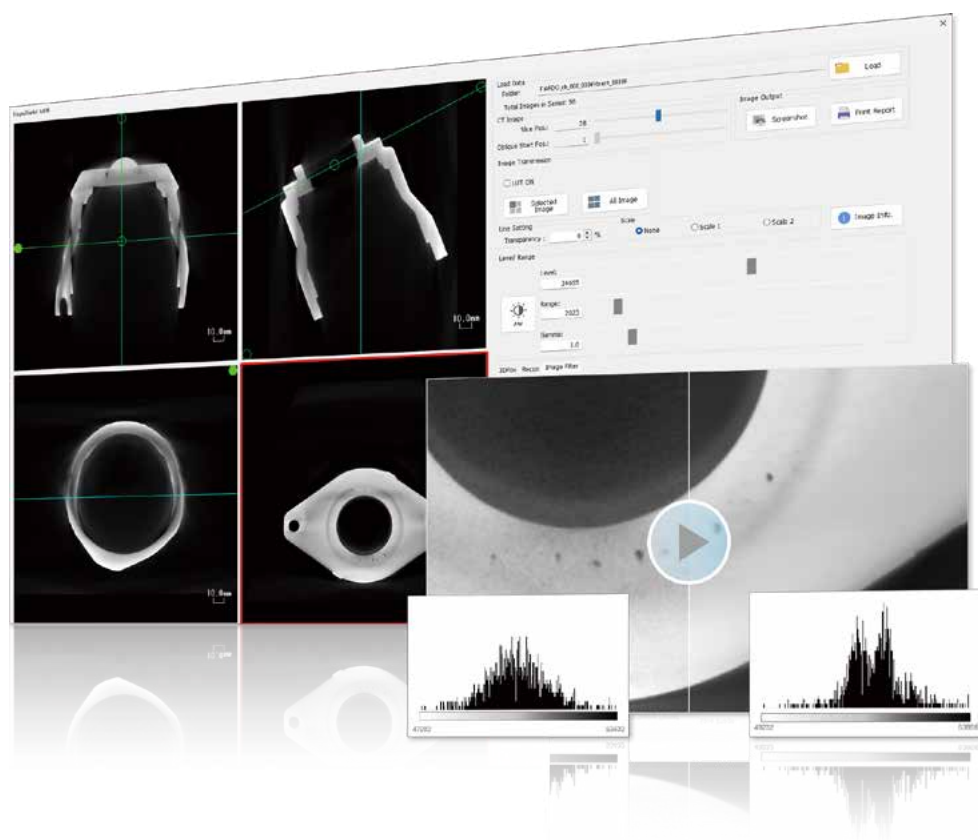


Option module for X-ray CT system

CORE Series



Three Solutions Enabled by the CORE Series

These optional CORE series modules offer additional functionality suitable for satisfying a wide variety of needs using Microfocus X-ray CT System inspeXio 7000 and SMX-225CT FPD HR Plus.



Having trouble with any of these?

1

Shapes do not appear sharp due to low contrast between different types of materials in composite workpieces.



CORE XDEF

NEW

Increase Contrast with Dual Energy CT Scanning

The industry's first dual-energy scanning technique is used to optimize contrast for each material.

2

Setting a short CT scan time, to prioritize shorter inspection cycle times, increases image noise and leads to inaccurate automatic analysis results based on threshold value settings.



CORE Xtract

NEW

Acquire Sharp Images with De-Noising Technology

A Shimadzu's proprietary algorithm is used to eliminate only image noise and achieve both high image quality and shorter inspection cycle times.

3

Reconstructing images with a high resolution will lengthen the waiting time for calculation processes and increase inspection cycle times.



CORE Boost

Ultra-Fast Calculation Technology Results in Dramatically Faster Image Reconstruction

A proprietary image reconstruction system uses high-speed parallel processing to acquire high-resolution images quickly.

CORE XDEF

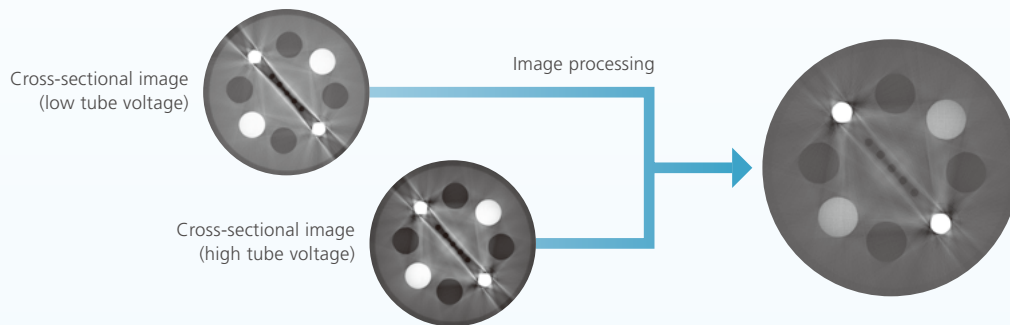
Taking CT Scanning to the Next Dimension

Dual Energy Improves the Efficiency of Composite Material Analysis

The CORE XDEF is an optional module that enables Dual Energy CT scanning, the first of its kind in the industry.*

Dual Energy CT scanning is a technique that performs CT scanning using two types of X-rays with different tube voltage levels, improving contrast and reducing metal artifacts.

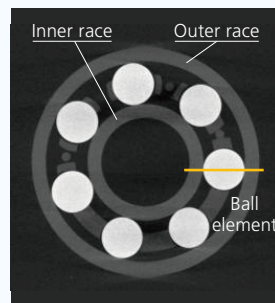
* Based on Shimadzu research as of August 2026, among industrial X-ray CT systems.



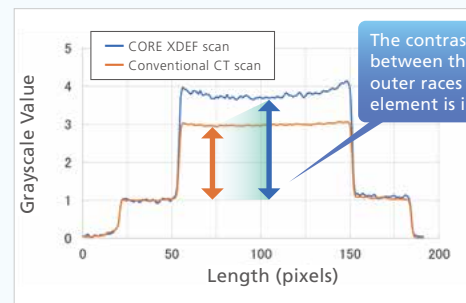
Point 1

Enables Analysis of Each Material in Composite Materials

In conventional CT scanning, low contrast can make it difficult to distinguish boundaries between resin materials and composite materials. The CORE XDEF module improves the contrast of each material and clarifies the boundaries.



Plastic Bearing
Image Acquired with CORE XDEF Module



The contrast difference between the inner and outer races and the ball element is increased

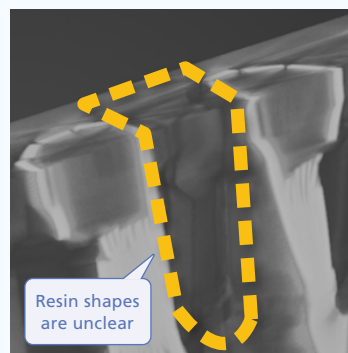
Line Profile at Yellow Line

Note: The vertical axis is normalized so that the grayscale value of air is 0 and that of the inner/outer races is 1.

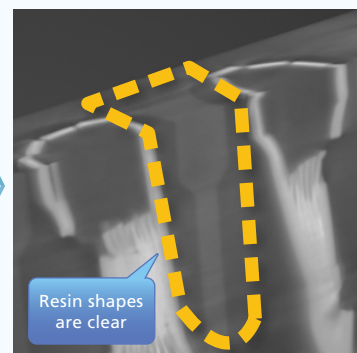
Point 2

Enables Observation of Shapes Previously Obscured by Artifacts

When observing composites made of metal and resin, the resin areas were difficult to observe due to metal artifacts. The CORE XDEF module can reduce metal artifacts, making it easier to observe voids and cracks in resin areas.



The structure of the resin area cannot be determined due to metal artifacts



Metal artifacts are reduced, making the resin shapes clearly observable

CORE Xtract

Increases both Speed and Image Quality

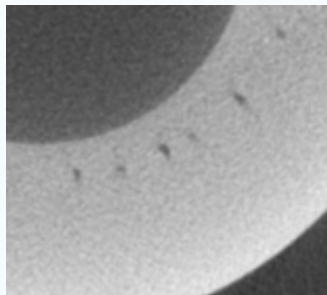
Maximizes Inspection Efficiency by Increasing Image Quality with a High-Speed Image Processing Filter

CORE Xtract is an optional module that enables filtering to reduce noise while preserving edges. Because the filtering produces high-quality images, CT scan times can be shortened.

Point 1

High-Quality Imaging Enables Higher Inspection Accuracy

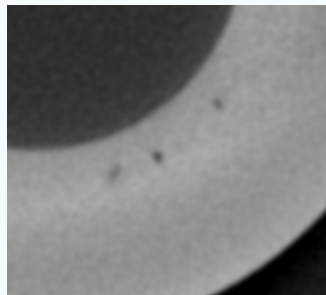
A key feature of CORE Xtract filtering is its ability to maintain workpiece edges, unlike typical smoothing processes. Consequently, visibility of even fine structures improves, which in turn can enhance inspection accuracy.



Original Image

Noise × High

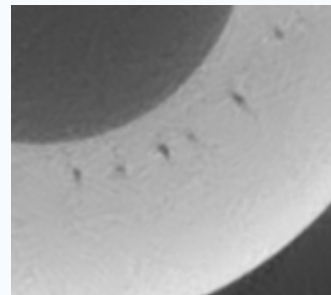
Edges ◎ Sharp



Conventional Image Processing Filter

Noise ◎ Reduced

Edges × Blurry



CORE Xtract

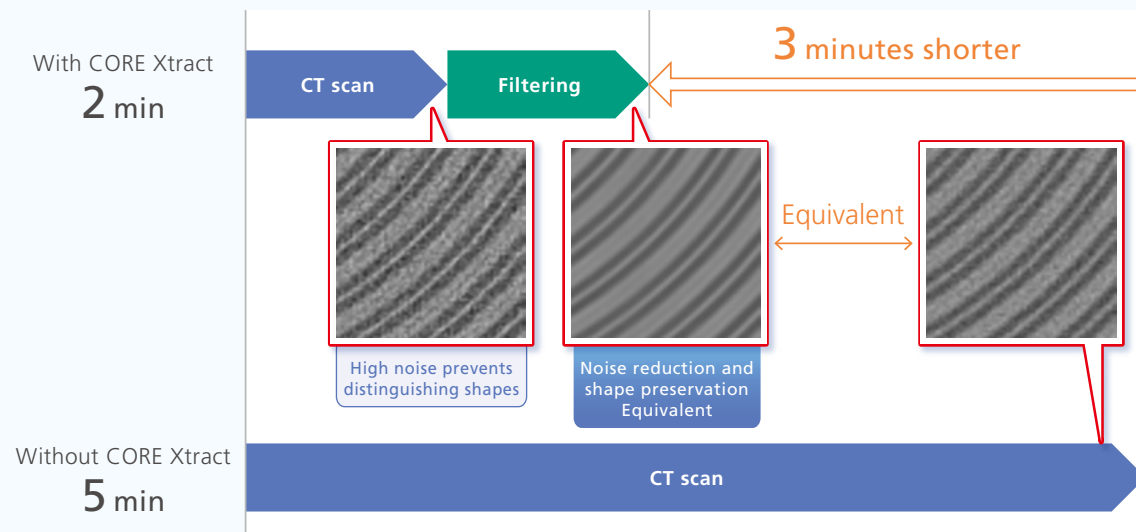
Noise ◎ Reduced

Edges ◎ Sharp

Point 2

Enables Shorter Cycle Times

CORE Xtract can shorten cycle times because its filtering enables acquisition of cross-sectional images equivalent to those obtained by long-duration scanning, even in a short scan time.



CORE Boost

Ultra-Fast Data Analysis Speed

Provides Comprehensive Support from CT Scanning to Image Analysis by Speeding up Image Reconstruction and Adding Functions

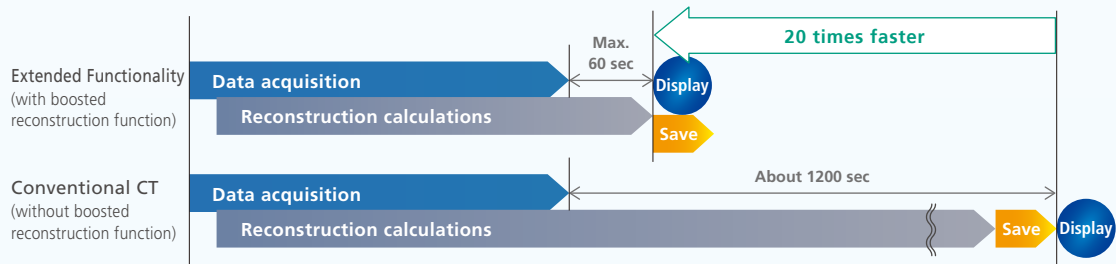
This optional module for inspeXio64 CT software adds two functions: boosted reconstruction and ROI image reconstruction.

Note: Development of the ROI image reconstruction function was supervised by Professor Hiroyuki Kudo of the Institute of Systems and Information Engineering at the University of Tsukuba.

Point 1

With Boosted Reconstruction, Even High-Resolution Cross-Sectional Images can be Viewed Immediately

Using Shimadzu's proprietary high-speed computing technology, we achieved faster high-resolution image reconstruction processing. 2048 × 2048 pixel images can be reconstructed 20 times faster than before, allowing images to be displayed within 60 seconds after data acquisition is finished.



Note: The imaging parameter settings above are for fine mode, full scan, 2400 views, 1500 slices, and a 2048 × 2048 reconstruction size.

Note: The boosted reconstruction function is optimized for faster image reconstruction processing, which might affect image quality.

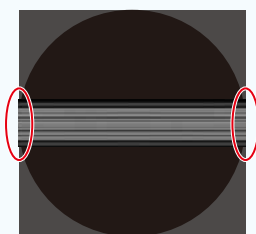
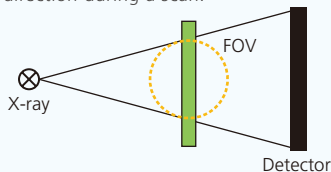
Point 2

ROI Image Reconstruction Inhibits Artifacts and Supports Image Data Analysis

By using the industry's first image reconstruction processing, higher image quality was achieved for data acquired with truncation. Because shading artifacts that conventionally occurred across the entire image from the truncated area can be reduced, analysis with image processing software becomes easier.

● Truncation

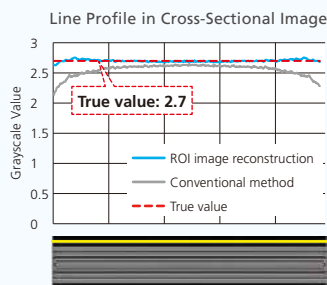
Truncation refers to a situation in which part of a workpiece extends beyond the detector in the lateral direction during a scan.



Truncated Cross-Sectional Image

● Effectiveness of Extended Functionality

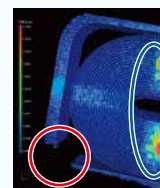
Reducing shading artifacts makes grayscale values more uniform and closer to the true value.



Note: Line profiles of cross-sectional images obtained by ROI image reconstruction were compared with those obtained by the conventional method.

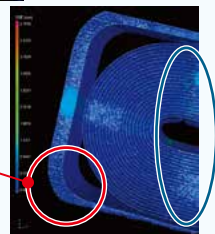
● Using CORE Boost for Data Analysis

This module enables visualization of missing areas and analysis without being affected by artifacts.



Conventional Method

Reduces shading artifacts



ROI Image Reconstruction

Conditions for Using CORE Series Modules

Applicable Models	inspeXio 7000, inspeXio SMX-225CT FPD HR Plus
Operating System*	Windows11, Windows 10

* For control computers with a Windows 7 operating system, CORE series modules can be installed by updating the control computer.

Precautions

- This software can only be used with the indicated models. It cannot be used with other models.
- Image quality improvement effects will vary depending on workpiece characteristics, such as shapes and materials. Be sure to confirm the effectiveness using an actual workpiece.
- The measurement accuracy of CT image data output by the software is not guaranteed.
- The content of this document is subject to change without notice.



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