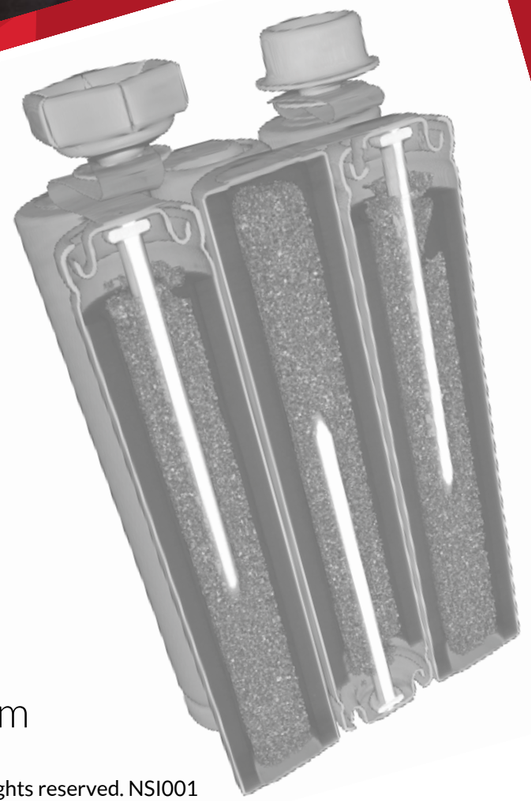


NORTH STAR IMAGING

NSI

AN ITW COMPANY

4nsi.com

xrayinspectionservice.com

NORTH STAR IMAGING

NSI

AN ITW COMPANY

2D DIGITAL RADIOGRAPHY SYSTEMS

3D COMPUTED TOMOGRAPHY SYSTEMS

X-RAY INSPECTION SERVICES

Over 30 years of Innovation

North Star Imaging (NSI) manufactures, sells and services state-of-the-art X-ray Imaging systems and CT equipment for industrial use. Our company also designs and develops the software applications used in our systems. NSI provides system solutions from basic low production or R&D, to high resolution/high production/high energy. Our standard range of products are extremely flexible to meet varied customer requirements.

NSI began in the field of industrial X-ray testing in 1986 in Minnesota. The company built its first Digital Radiography equipment in 1991 and first Computed Tomography system in 2002. From 2006, NSI widened its services and added an Inspection Services Group (ISG) offering need based consulting for anyone needing X-ray and/or computed tomography scanning. Aside from the ISG services, the company also has a Technical Service & Support team that is on call 24/7 to address immediate global customer service needs.

In 2010, the company was acquired by ITW, a global company with 51,000 employees across 56 countries. Then in 2012, NSI doubled the size of its facility in Minnesota and opened North Star Imaging Europe in Paris (France) .

The global demand for powerful X-ray and CT equipment that provide precise and automatic material analysis with a non-destructive view of composite structures is what pushes NSI to constantly raise its bar of excellence in product innovation. The company has the widest product portfolio range in the industry today which keeps NSI way ahead of its competition. NSI offers seven (7) standard X-ray and CT/micro CT systems including the newly launched X3000.

The corporate office is located in the city of Rogers, just outside Minneapolis, Minnesota. This facility has about 80 skilled employees including application specialists, mechanical engineers, software engineers, programmers, level III instructors and others. NSI is an ISO 9001:2015 certified company.

In 2015 NSI opened facilities in the West Coast (CA) and the United Kingdom.
In 2016 NSI opened an Asia office in Suzhou, China.
In 2017 NSI opened an office in the East Coast (MA).

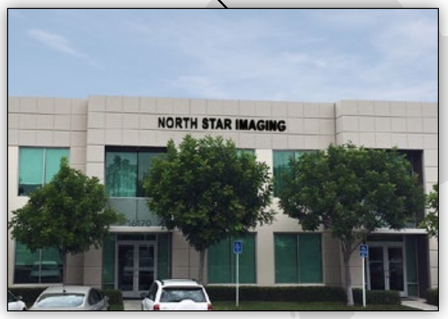
NSI Quality Policy:

The people of ITW North Star Imaging are committed to understanding and achieving our customer's expectations and providing world class imaging products and services driven by a culture of continual improvement.

ISO 9001:2015

Truly a Global Company

Today, North Star Imaging is one of the leading manufacturers of 2D Digital Radiography and 3D Computed Tomography systems in the world. Additionally, each worldwide location houses state of the art equipment for demonstration and need based X-ray/CT Inspection Services. No matter your location, NSI has local employees ready to help evaluate your needs, explain the technology and provide thorough training upon installation. Furthermore, each NSI location employs dedicated service personnel, so local help is never more than a phone call away.



OUR LOCATIONS

North Star Imaging Rogers
19875 S. Diamond Lake Road
Rogers, Minnesota 55374
USA
PHONE: (763) 463-5650
TOLL FREE: 1 (800) 635-8392
EMAIL: sales@4nsi.com
4nsi.com

North Star Imaging Europe
Les Frégates 6
Hall F Paris Nord II
13 Rue de la Perdrix
93290 Tremblay-en-France
France
PHONE: +33 1 48 17 02 00
EMAIL: sales.eu@4nsi.com
4nsi.eu

North Star Imaging California
16170 Scientific Way
Irvine, California 92618
USA
PHONE: (949) 346-1299
EMAIL: scanning.ca@4nsi.com
4nsi.com

North Star Imaging United Kingdom
Instron European Headquarters
Coronation Road
High Wycombe, Buckinghamshire
HP12 3SY
UK
PHONE: +44 7557 034195
EMAIL: sales.uk@4nsi.com
4nsi.eu

North Star Imaging Massachusetts
362 Elm Street Unit #9
Marlborough, MA 01752
USA
PHONE:(617) 600-6284
EMAIL: scanning.ma@4nsi.com
4nsi.com

North Star Imaging China
No. 2 Anzhi Street
Suzhou Industrial Park
215026 Suzhou, Jiangsu Province
China
PHONE: +86 18516 332 893
EMAIL: sales.asia@4nsi.com
4nsi.com

NSI has representatives located throughout Europe, Asia, and many other countries. Visit us at 4nsi.com or email sales@4nsi.com for more details.

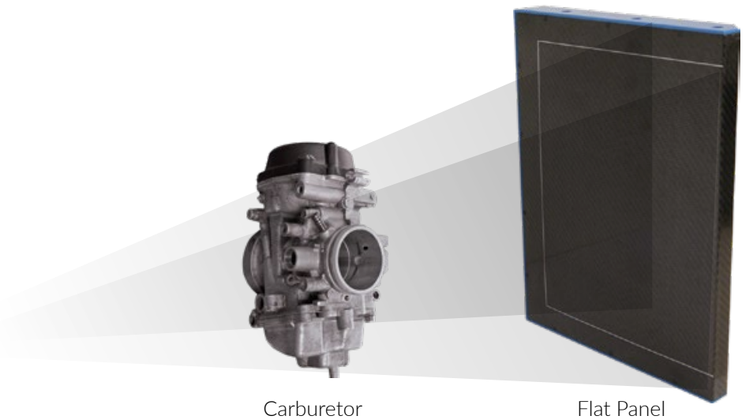
What is Digital Radiography?

Digital Radiography, or DR for short, is a 2D X-ray inspection method using a digital X-ray detector in place of X-ray film. DR allows for real-time X-ray inspection of your part or object - no more waiting for film to process! You can make scan adjustments on the fly and also apply digital image enhancements quickly and easily – saving you time.

Digital Radiography detectors are designed to be used time after time, helping to eliminate the cost of consumables – saving you money.

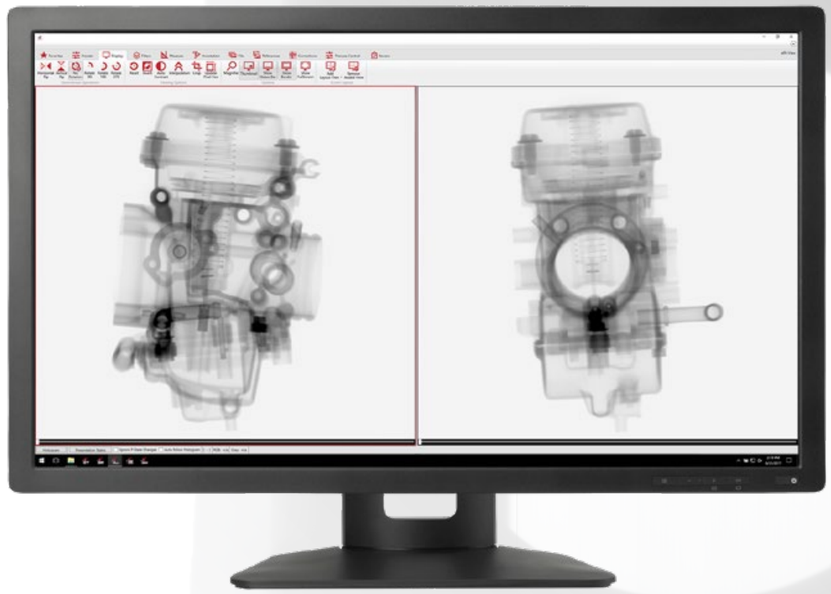
Our Digital Radiography systems are designed to make your business and your team as efficient as possible. Programmed and repeatable inspection sequences, easy to use software and superior image quality lets you focus more monitoring your product quality while also increasing throughput.

X-ray Tube



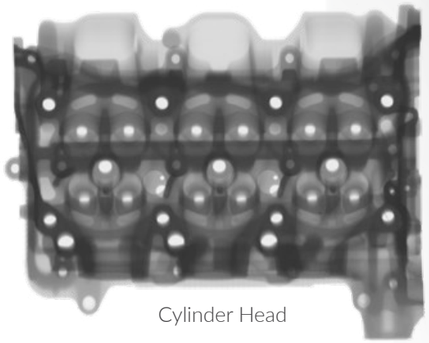
Carburetor

Flat Panel
X-ray Detector



Flashlight

Capacitor



Cylinder Head

What is Computed Tomography?

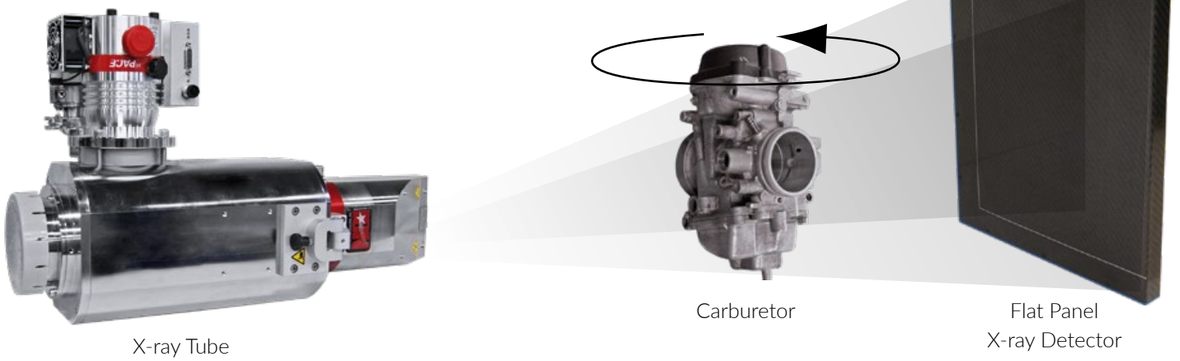
3D Computed Tomography (CT) is a nondestructive scanning technology that allows you to view and inspect the external and internal structures of an object in 3D space. Computed Tomography works by taking hundreds or thousands of 2D Digital Radiography projections around a 360 degree rotation of an object. Proprietary algorithms are then used to reconstruct the 2D projections into a 3D CT volume, which will allow you to view and slice the part at any angle.

3D CT virtually eliminates interpretation errors and opens the door to many capabilities that are not available with any other technology.

CT Capabilities Include:

- Internal and external measurements
- 3D CAD comparisons
- Void analysis
- Surface reconstructions for reverse engineering
- Finite Element Analysis
- And much more

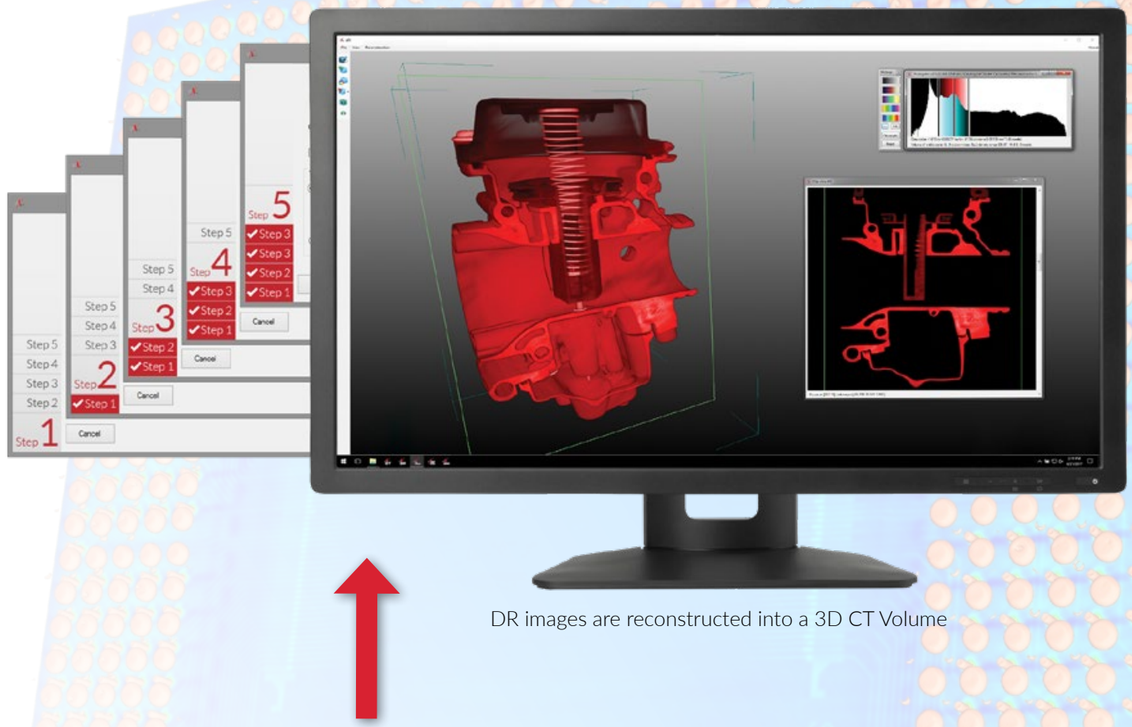
North Star Imaging Computed Tomography systems are the easiest to use in the industry. NSI's efX-CT software uses five simple steps to guide you through the CT scanning process and have you inspecting your product in no time – increasing your quality and efficiency.



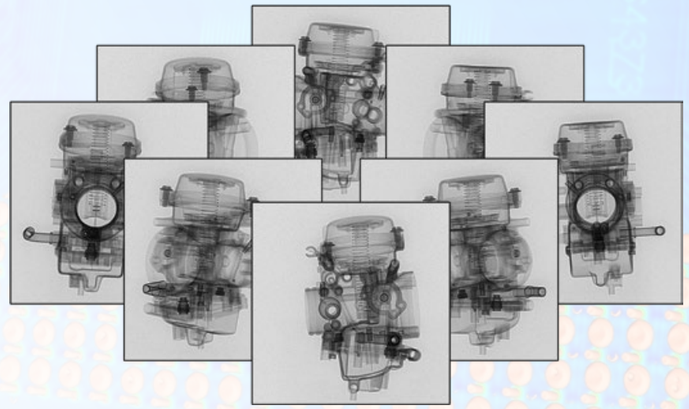
X-ray Tube

Carburetor

Flat Panel
X-ray Detector

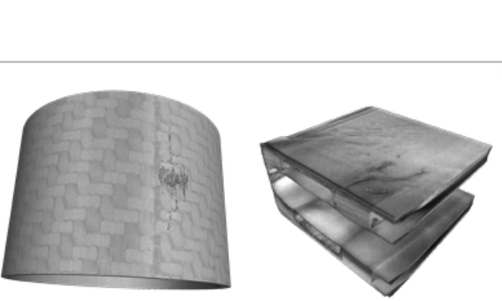


DR images are reconstructed into a 3D CT Volume

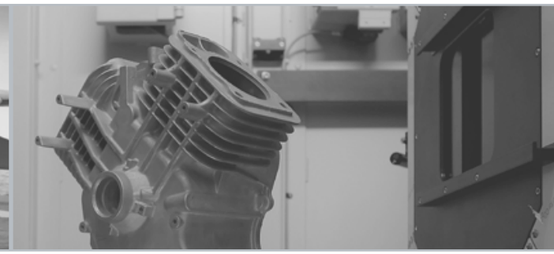
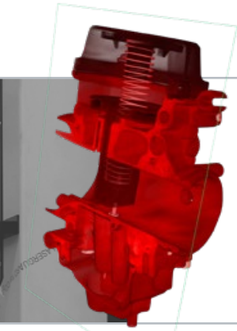
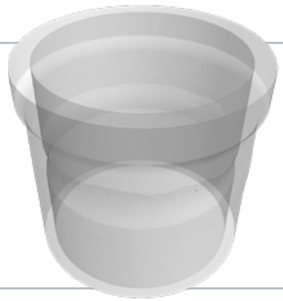


100's to 1000's of DR images are collected

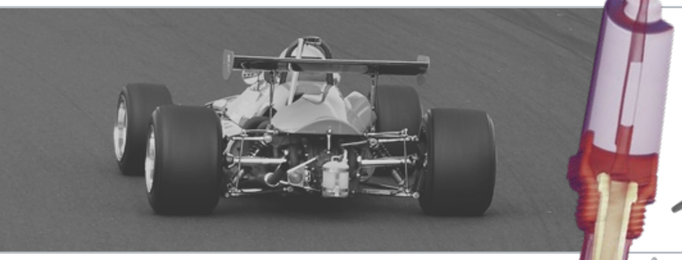
Applications & Markets



Aerospace

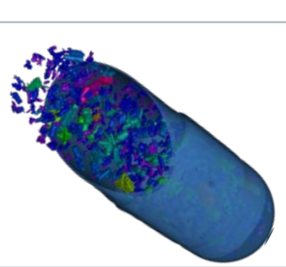

Castings

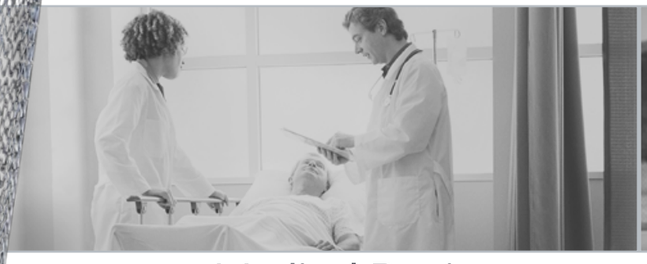



Automotive

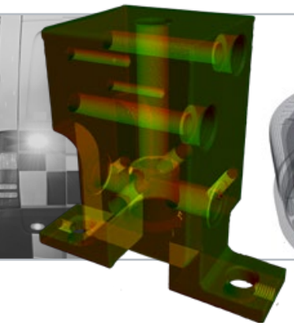
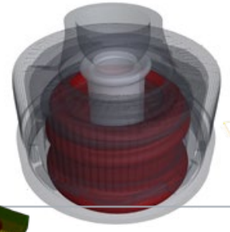
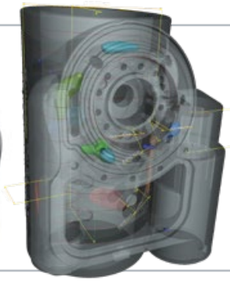



Electronics

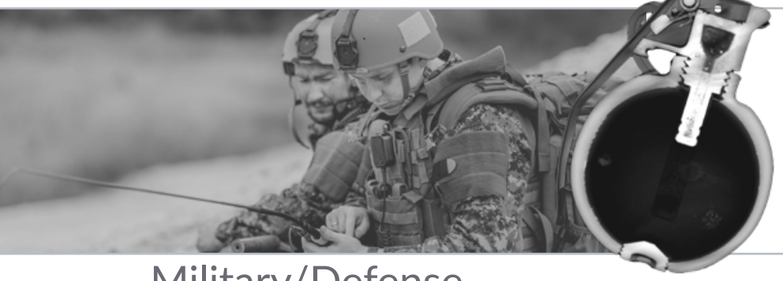


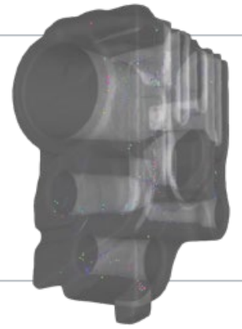
Medical Devices

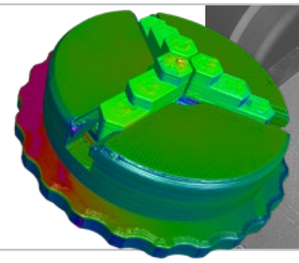
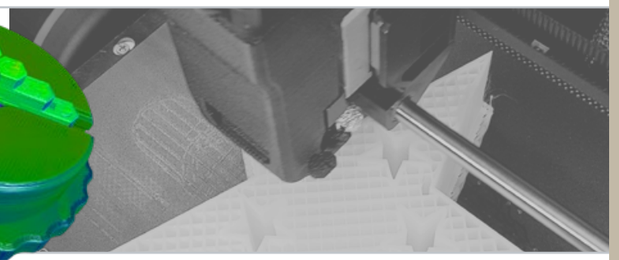





Plastics



Military/Defense



Additive Manufacturing

NOTES

We Build World Class Industrial Digital X-ray and 3D Computed Tomography Systems

So you can develop the world's best products

A Full Range of Systems

North Star Imaging offers a full range of systems to meet your digital radiography, computed tomography, and metrology needs. All our systems are modular, giving customers the flexibility to select the best combination of features for their application.

Our systems are designed with superior resolution and accuracy while maintaining an easy to use interface. Whether it's high speed 3D scanning, failure anlysis, or reverse engineering, our systems are built for efficiency and repeatabillity to ensure your components fuction safely and correctly each and every time.

Big or small, we cover it all. Ranging in size from compact to large vault options, you can seamlessly acquire full internal and external details of your components. From new product development to process development to quality control, X-ray technology saves time and money throughout the product lifecycle.

Systems

IMAGIX®

Economical & Simplistic

The ImagiX is North Star Imaging's most compact system. The generous scanning envelope can handle products up to 5 in (12 cm) in size making it a great choice for laboratories, small electronics and R&D applications.

SYSTEM CAPABILITIES
- Advanced 2D X-ray inspection
- 2D CT Slice reconstruction
- CT volume reconstruction for 3D inspection
- 3D internal and external surface scanning
- Overall Maximum System Resolution: ~5 microns
- 5 in (12 cm) diameter x 5 in (12 cm) tall nominal part envelope

CT SOFTWARE
- Reconstruct 3D models quickly using our 5-step guided wizard
- Comprehensive acquisition, processing and archival program with user-friendly interface
- Local CT and Limited angle CT reconstruction capabilities
- High performance image processing and measurement functions
- DICONDE compliant
- Non-proprietary multiple image format
- Computed Tomography acquisition module
- 3D Computed Tomography reconstruction and visualization
- Optional 4D Computed Tomography

X-RAY SOURCE
- Micro-focus X-ray tube
- Voltage Range: 10 kV - 150 kV
- Minimum Focal Spot Size: ~5 microns

X-RAY DETECTOR
- Digital X-ray detector types: Flat Panel
- Grade Options: Standard, Premium, or ASTM
- Detector Size: up to 8 in x 10 in (20 cm x 25 cm)

MANIPULATOR
- Maximum Sample Weight: 10 lb (4.5 kg)
- Focal Distance : variable up to 24 in (61 cm)
- Manipulator Travel:
  Vertical = 5.4 in (13.71 cm)
  Rotation = 360°
- Vertical imaging coverage: variable up to 8 in (20 cm)
- Rotational stage with high precision
- Optional motion controlled 3 axis

CABINET
- External Dimension: 57 in Wide, 30 in Deep, 58 in Tall (144 cm Wide, 76 cm Deep, 147 cm Tall)
- Cabinet Features: interior lighting, sliding access door, leaded glass viewing window
- Meets or exceeds 21 CFR 1020.40 and EN 61010-2-091 2012
- System includes one ergonomic desk and chair

Exact specifications vary depending on tube, detector, optional configurations, and application

X25

Compact & Efficient

The X25 is quite possibly the most conveniently sized system on the market. The system offers all of the same creature features as the larger systems while still maintaining the ability to fit through a standard interior door. The X25 is well suited for small to medium sized objects.

SYSTEM CAPABILITIES
- X-ray Energies from 10 kV - 160 kV
- Geometric Magnification: >2000x
- Overall Maximum System Resolution: ~500 nm
- 6 in (15 cm) diameter x 9 in (22 cm) tall nominal part envelope

CT SOFTWARE
- Reconstruct 3D models quickly using our 5-step guided wizard
- Comprehensive acquisition, processing and archival program with user-friendly interface
- Local CT and Limited angle CT reconstruction capabilities
- High performance image processing and measurement functions
- DICONDE compliant
- Non-proprietary multiple image format
- Computed Tomography acquisition module
- 3D Computed Tomography reconstruction and visualization
- Optional 4D Computed Tomography

X-RAY SOURCE
- Voltage Range: 10 kV - 160 kV
- Minimum Focal Spot Size: ~500 nm
- X-ray Tube Types: Nano-focus, Micro-focus

X-RAY DETECTOR
- Digital X-ray Detector Types: Flat Panel (DDA)
- Grade Options: Standard, Premium, or ASTM
- Detector Size: Up to 9 in x 11 in (22 cm x 27 cm)

MANIPULATOR
- Maximum Sample Weight: 25 lb (11 kg)
- Focal distance: variable up to 39 in (99 cm)
  Manipulator Travel:
  Vertical = 9 in (22 cm),
  Horizontal (x-axis) = 6 in (15 cm)
  Rotation = 360°
  Vertical image coverage: variable up to 11 in (27 cm)
- Part Manipulation Control:
  - » All drives variable speed joystick controlled
  - » Each axis is independently controlled
- Programmable motion control for automated scanning with image processing and archiving capabilities

CABINET
- External Dimensions: 73 in Wide, 38 in Deep, 71 in Tall (185 cm Wide, 96 cm Deep, 180 cm Tall)
- Weight: 3500 lb (1590 kg)
- Transportable through standard 36 in (92 cm) wide doors
- Cabinet Features: Cable access port with cover, interior lighting, powered sliding access door, leaded glass viewing window, safety light curtains
- Steel/lead/steel construction
- Meets or exceeds 21 CFR 1020.40 and EN 61010-2-091 2012
- Touch screen operation
- System includes one ergonomic desk and chair

Exact specifications vary depending on tube, detector, optional configurations, and application

X50

Powerful & Ergonomic

The X50 is one of NSI's most popular models for electronics, aerospace components and medical devices. It offers an excellent balance of power and space sensitivity. The system can handle products up to 12 in (30 cm) in size while seated nicely in your failure analysis lab or busy production line.

SYSTEM CAPABILITIES
- X-ray Energies from 10 kV - 240 kV
- Geometric Magnification: >3000x
- Overall Maximum System Resolution: ~500 nm
- 12 in (30 cm) diameter x 12 in (30 cm) tall nominal part envelope

CT SOFTWARE
- Reconstruct 3D models quickly using our 5-step guided wizard
- Comprehensive acquisition, processing and archival program with user-friendly interface
- High performance image processing and measurement functions
- DICONDE compliant
- Non-proprietary multiple image format
- Computed Tomography acquisition module
- 3D Computed Tomography reconstruction and visualization
- Optional 4D Computed Tomography
- Available with vorteX

X-RAY SOURCE
- Voltage Range: 10 kV - 240 kV
- Minimum Focal Spot Size: ~500 nm
- X-ray Tube Types: Nano-focus, Micro-focus, Mini-focus
- Optional dual tube head configuration

X-RAY DETECTOR
- Digital X-ray Detector Types: Flat Panel (DDA)
- Grade Options: Standard, Premium, or ASTM
- Detector Size: Up to 16 in x 16 in (40 cm x 40 cm)

MANIPULATOR
- Maximum Sample Weight: 25 lb (11 kg)
- Focal distance: variable up to 53 in (134 cm)
- Manipulator Travel:
  Vertical = 12 in (30 cm)
  Horizontal (x-axis) = 12 in (30 cm)
  Tilt = ±20°
  Rotation = 360° Continuous
- Part Manipulation Control:
  - » All drives variable speed joystick controlled
  - » Each axis is independently controlled
- Programmable motion control for automated scanning with image processing and archiving capabilities

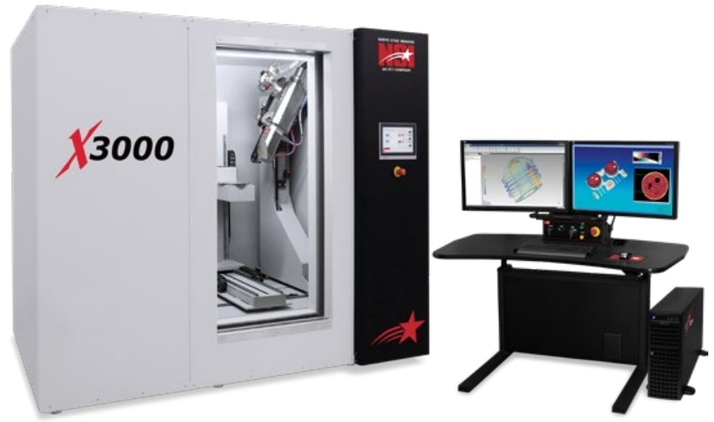
CABINET
- External Dimensions: 87 in Wide, 52 in Deep, 79 in Tall (221 cm Wide, 132 cm Deep, 201 cm Tall)
- Weight: 9500 lb (4300 kg)
- Cabinet Features: Cable access port with cover, interior lighting, leaded glass viewing window, 24 in x 36 in (60 cm x 91 cm) powered sliding access door, safety light curtains
- Steel/lead/steel construction
- Meets or exceeds 21 CFR 1020.40 and EN 61010-2-091 2012
- Touch screen operation
- System includes one ergonomic desk and chairs

Exact specifications vary depending on tube, detector, optional configurations, and application

X3000

Dynamic & Precise

The X3000 is North Star Imaging's newest standard system. Whether you are inspecting small or large components, the X3000 is the best option for customers needing a compact system with unique capabilities generally available on a larger X-ray or CT system.



SYSTEM CAPABILITIES
- X-ray Energies from 10 kV - 240 kV
- Geometric Magnification: >3000x
- Overall Maximum System Resolution: ~500 nm
- 19.5 in (50 cm) diameter x 24 in (61 cm) tall nominal part envelope

CT SOFTWARE
- Reconstruct 3D models quickly using our 5-step guided wizard
- Comprehensive acquisition, processing and archival program with user-friendly interface
- High performance image processing and measurement functions
- DICONDE compliant
- Non-proprietary multiple image format
- Computed Tomography acquisition module
- 3D Computed Tomography reconstruction and visualization
- Optional 4D Computed Tomography
- Available with vorteX, subpiX and mosaiX

X-RAY SOURCE
- Voltage Range: 10 kV - 240 kV
- Minimum Focal Spot Size: ~500 nm
- X-ray Tube Types: Nano-focus, Micro-focus, Mini-focus
- Optional dual tube head configuration

X-RAY DETECTOR
- Digital X-ray Detector Types: Flat Panel (DDA)
- Flat Panel Detector Size: Up to 16 in x 16 in (40 cm x 40 cm)
- Grade Options: Standard, Premium, or ASTM

MANIPULATOR
- Maximum Sample Weight: 75 lb (34 kg) standard
  Manipulator Travel:
  Vertical =24 in (61 cm)
  Horizontal (x-axis) = 13 in (33 cm)
  Rotation = 360° Continuous
- Nominal part envelope: Diameter: 19.5 in (50 cm) Height: 24 in (61 cm)
- Programmable motion control for automated scanning with image processing and archiving capabilities

(*Also available in a standalone version)

CABINET
- External Dimensions: 103.5 in (263 cm) Wide x 51.9 in (132 cm) Deep x 79 in (201 cm) Tall
- Weight: 9500 lb (4300 kg)
- Cabinet Features: Cable access ports with cover, interior lighting, 32 in x 59 in (81 cm x 150 cm) powered sliding access door, safety light curtains
- Steel/lead/steel construction
- Meets or exceeds 21 CFR 1020.40 and EN 61010-2-091 2012
- Touch screen operation
- Includes one ergonomic desk and chair

Exact specifications vary depending on tube, detector, optional configurations, and application

X5000

Universal & Flexible

The X5000 is the most versatile system offered by North Star Imaging. The system boasts a large scanning envelope and excellent ergonomics for loading sizable objects while still maintaining the sensitivity to inspect even the smallest of items.

SYSTEM CAPABILITIES
- X-ray Energies from 10 kV - 450 kV
- Geometric Magnification: >3000x
- Overall Maximum System Resolution: ~500 nm
- 32 in (81 cm) diameter x 48 in (121 cm) tall nominal part envelope

CT SOFTWARE
- Reconstruct 3D models quickly using our 5-step guided wizard
- Comprehensive acquisition, processing and archival program with user-friendly interface
- High performance image processing and measurement functions
- DICONDE compliant
- Non-proprietary multiple image format
- Computed Tomography acquisition module
- 3D Computed Tomography reconstruction and visualization
- Optional 4D Computed Tomography
- Available with vorteX, subpiX and mosaiX

X-RAY SOURCE
- Voltage Range: 10 kV - 450 kV
- Minimum Focal Spot Size: ~500 nm
- X-ray Tube Types: Nano-focus, Micro-focus, Mini-focus
- Optional dual tube configuration
- Optional dual tube head configuration

X-RAY DETECTOR
- Digital X-ray Detector Types: Flat Panel (DDA), Linear Diode Array
- Grade Options: Standard, Premium, or ASTM
- Detector Size: Up to 16 in x 16 in (40 cm x 40 cm)
- Optional dual detector configuration

MANIPULATOR
- Maximum Sample Weight: 500 lb (227 kg)
- Manipulator Travel:
  Vertical = 48 in (121 cm)
  Horizontal = 32 in (83 cm)
  Tilt = ±20°
  Rotation = 360° Continuous
- Motorized detector travel for variable focal distance adjustment
- Part Manipulation Control:
  - » All drives variable speed joystick controlled
  - » Each axis is independently controlled
- Programmable motion control for automated scanning with image processing and archiving capabilities
- Optional external part loading/unloading

(*Also available in a standalone version)

CABINET
- External Dimensions:
  - » 107 in Wide x 80 in Deep x 92 in Tall (271 cm Wide, 203 cm Deep, 233 cm Tall)
- Weight: 240 kV = 14800 lb (6170 kg), 450 kV - 29000 lb (13200 kg)
- Cabinet Features: Cable access port with cover, interior lighting, powered 30 in x 63 in (76 cm x 160 cm) sliding access door, leaded glass viewing window (240 kV model), internal camera monitoring system (450 kV model), safety light curtains
- Steel/lead/steel construction
- Meets or exceeds 21 CFR 1020.40 and EN 61010-2-091 2012
- Touch screen operation
- Includes one ergonomic desk and chair

Exact specifications vary depending on tube, detector, optional configurations, and application

X6000

Versatile & Adaptive

The X6000 is specifically designed for castings and other large and heavy products. The system features a programmable C-arm manipulator for automated and repeatable inspection sequences. The massive access door and external indexing rotational stage make loading quick and easy.

SYSTEM CAPABILITIES
- Shielded to 160 kV or 225 kV
- Capable of scanning large components
- 30 in (76 cm) diameter x 68 in (172 cm) all nominal part envelope

CT SOFTWARE
- Reconstruct 3D models quickly using our 5-step guided wizard
- Comprehensive acquisition, processing and archival program with user-friendly interface
- High performance image processing and measurement functions
- DICONDE compliant
- Non-proprietary multiple image format
- Computed Tomography acquisition module
- 3D Computed Tomography reconstruction and visualization

X-RAY SOURCE
- Voltage Range: 10 kV - 225 kV
- X-ray Tube Types: Micro-focus, Mini-focus

X-RAY DETECTOR
- Digital X-ray Detector Types: Flat Panel (DDA)
- Grade Options: Standard, Premium, or ASTM
- Flat Panel Detector Size: Up to 12 in x 16 in (30 cm x 40 cm)

MANIPULATOR
- Maximum Sample Weight: 400 lb (181 kg)
- Focal distance: variable up to 48 in (122 cm)
- Manipulator Travel:
  Vertical = 68 in (173 cm)
  Horizontal = 48 in (122 cm)
  Lateral = 46 in (117 cm)
  C-Arm Tilt = ±60°
  Rotation = 360° Continuous
- Vertical imaging coverage: variable up to 68 in (173 cm)
- Motorized detector travel for variable focal distance adjustment
- Part Manipulation Control:
  - » All drives variable speed joystick controlled
  - » Each axis is independently controlled
- Programmable motion control for automated scanning with image processing and archiving capabilities

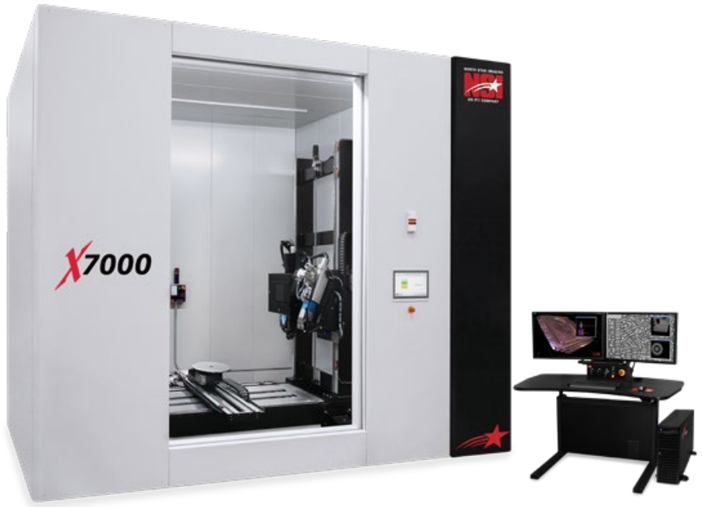
CABINET
- External Dimensions: 139 in Wide x 120 in Deep x 132 in Tall (353 cm Wide, 304 cm Deep, 335 cm Tall) (varies depending on shielding)
- Weight: 25300 lb (11476 kg)
- Cabinet Features: Cable access ports with cover, interior lighting, safety light curtains, 52 in x 90 in (132 cm x 229 cm) powered bi-parting sliding access doors, two leaded glass viewing windows
- Steel/lead/steel construction
- Meets or exceeds 21 CFR 1020.40 and EN 61010-2-091 2012
- Touch screen operation
- Includes one ergonomic desk and chair

Exact specifications vary depending on tube, detector, optional configurations, and application

X7000

Modular & Robust

The X7000 is North Star Imaging's largest standard system. The large scanning envelope and generous focal distance allow for unparalleled inspection capabilities of very large objects. The system is great for composites, castings, pipes, tubes, welds and similar parts.



SYSTEM CAPABILITIES
- X-ray Energies from 10 kV - 450 kV
- Capable of scanning large components
- 60 in (152 cm) diameter x 60 in (152 cm) tall nominal part envelope

CT SOFTWARE
- Reconstruct 3D models quickly using our 5-step guided wizard
- Comprehensive acquisition, processing and archival program with user-friendly interface
- High performance image processing and measurement functions
- DICONDE compliant
- Non-proprietary multiple image format
- Computed Tomography acquisition module
- 3D Computed Tomography reconstruction and visualization
- Optional 4D Computed Tomography
- Available with vorteX, subpiX and mosaiX

X-RAY SOURCE
- Voltage Range: 10 kV - 450 kV
- Minimum Focal Spot Size: ~5 microns
- X-ray Tube Types: Micro-focus, Mini-focus
- Optional dual tube configuration

X-RAY DETECTOR
- Digital X-ray Detector Types: Flat Panel (DDA), Linear Diode Array (LDA)
- Grade Options: Standard, Premium, or ASTM
- Flat Panel Detector Size: Up to 16 in x 16 in (40 cm x 40 cm)
- LDA size up to 36 in (91 cm)
- Optional dual detector configuration

MANIPULATOR
- Maximum Sample Weight: 500 lb (227 kg)
- Maximum Focal distance: >90 in (228 cm)
- Manipulator Travel:
  Vertical = 60 in (152 cm)
  Horizontal (x-axis) = variable up to 48 in (123 cm)
  Tilt = ±20°
  Rotation = 360° Continuous
- Motorized detector travel for variable focal distance adjustment
- Part Manipulation Control:
  - » All drives variable speed joystick controlled
  - » Each axis is independently controlled
- Programmable motion control for automated scanning with image processing and archiving capabilities
- Optional external part loading/unloading

(*Also available in a standalone version)

CABINET
- External Dimensions: 191 in Wide x 130 in Deep x 137 in Tall (485 cm Wide, 330 cm Deep, 348 cm Tall) (varies depending on shielding)
- Weight: 50000 lb (22680 kg)
- Cabinet Features: Cable access ports with cover, interior lighting, powered bi-parting sliding access doors (68 in x 88 in (173 cm x 223 cm) door opening), internal camera monitoring system, safety light curtains
- Steel/lead/steel construction
- Meets or exceeds 21 CFR 1020.40 and EN 61010-2-091 2012
- Touch screen operation
- Includes one ergonomic desk and chair

Exact specifications vary depending on tube, detector, optional configurations, and application

X3500 X5500 X7500

Standalone Manipulators

North Star Imaging's Standalone Manipulators offer the flexibility to reuse an existing cabinet or vault. These manipulators feature the same great functionality of our other systems while taking advantage of your existing resources.

SYSTEM CAPABILITIES
- Versitale installation into existing vaults/cabinets
- Capable of scanning large components

CT SOFTWARE
- Reconstruct 3D models quickly using our 5-step guided wizard
- Comprehensive acquisition, processing and archival program with user-friendly interface
- High performance image processing and measurement functions
- DICONDE compliant
- Non-proprietary multiple image format
- Computed Tomography acquisition module
- 3D Computed Tomography reconstruction and visualization
- Optional 4D Computed Tomography
- Available with vorteX, subpiX and mosaiX

X-RAY SOURCE
- Voltage Range: 10 kV - 450 kV (240 kV max on X3500)
- X-ray Tube Types: Nano-focus, Micro-focus, Mini-focus
- Optional dual tube configuration
- Optional dual tube head configuration

X-RAY DETECTOR
- Digital X-ray Detector Types: Flat Panel (DDA), Linear Diode Array (LDA) (LDA available on X5500 & X7500)
- Grade Options: Standard, Premium or ASTM
- Flat Panel Detector Size: Up to 16 in x 16 in (30 cm x 40 cm)
- LDA size up to 36 in (91 cm) (Available on X5500 & X7500)
- Optional dual detector configuration (Available on X5500 & X7500)

MANIPULATOR
- See X3000, X5000 & X7000 for detailed specifications
- Motorized detector travel for variable focal distance adjustment
- Part Manipulation Control:
  - » All drives variable speed joystick controlled
  - » Each axis is independently controlled
- Programmable motion control for automated scanning with image processing and archiving capabilities

Exact specifications vary depending on tube, detector, optional configurations, and application

Systems

robotiX

Automatic Part Loading & Unloading

robotiX technology makes automatic part loading and unloading effortless through a simple programing interface that allows the end-user to easily create new robotic motion programs. Adding robotiX to a system reduces cycle time, increases productivity, and allows for more efficient use of the equipment.

BENEFITS

- Automatic part loading/unloading
- Reduced cycle time for increased productivity
- Simple user interface
- Seamless integration with efX-DR & CT
- Ability to upgrade existing systems
- OSHA compliant safety area scanner

CONFIGURATION

- 5 or 6 Axis
- Reach dependent upon application
- Capacity dependent upon application
- Up to ±0.00079 in (±0.02 mm) repeatability
- Precision option available
- Available on the X25, X50, X3000, X5000 & X7000

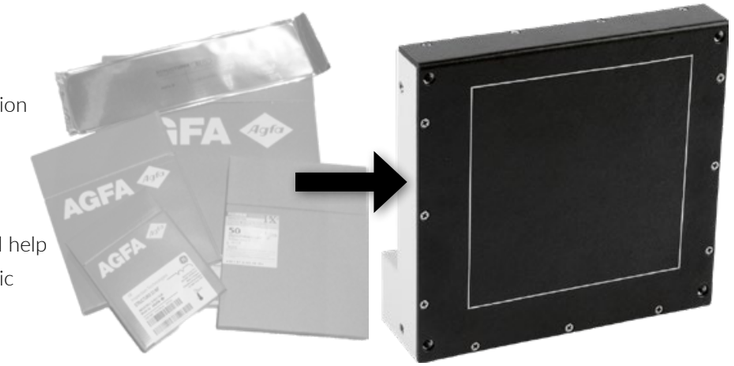
Exact specifications vary depending on tube, detector, optional configurations, and application

Upgrades

Film to Real Time Digital Radiography

Benefits

- Less consumables = Reduced Costs
- Real time evaluation capability = Increase Productivity
- Higher resolution results = Increased Inspection Capabilities/Quality Control



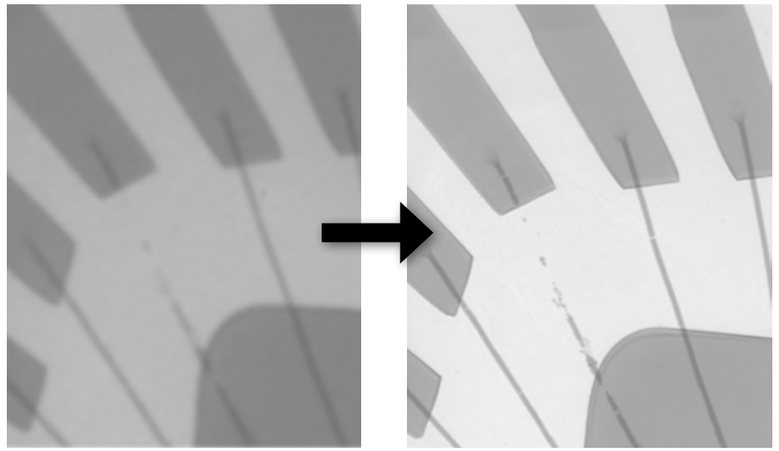
Typical package includes:

- New digital flat panel X-ray detector (NSI will help you choose the best detector for your specific application)
- New software
- New real time workstation

Real Time Digital Radiography Performance Upgrade

Benefits

- Updated software = Increased Productivity and Higher Resolution Results
- Higher resolution results = Increased Inspection Capabilities/Quality Control



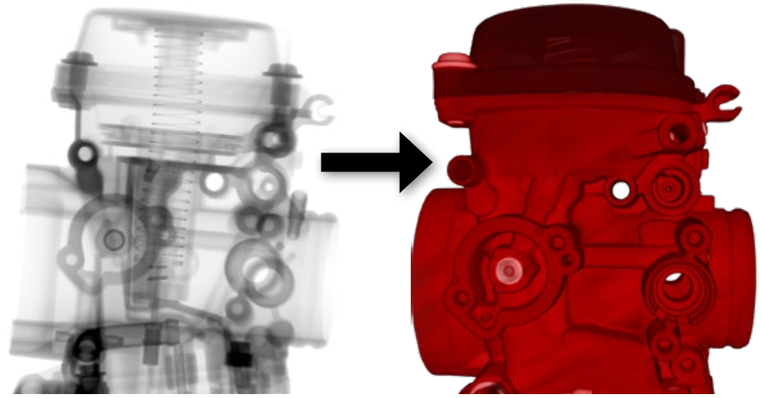
Typical package includes:

- New digital flat panel X-ray detector
- New X-ray tube (mini, micro, nano) (90 kV to 450 kV)
- New DR acquisition and processing software

2D Real Time Digital Radiography to 3D Computed Tomography Upgrade

Benefits

- Full 3D CT capabilities without the cost of a new CT system
- 3D Metrology and Reverse Engineering capabilities
- Complete 3D Inspection = Increased Inspection Quality



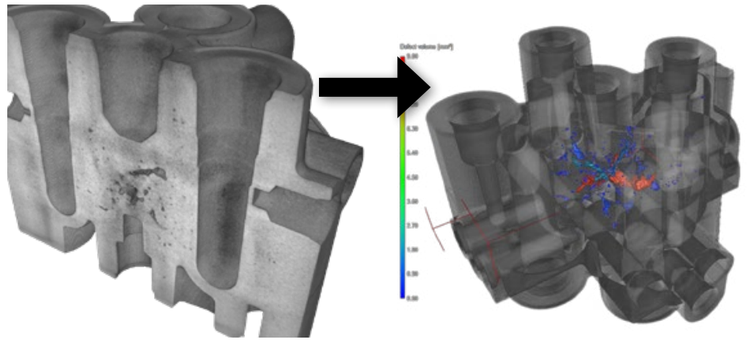
Typical package includes:

- efX-CT software – includes geometry definition, reconstruction and 3D visualization
- CT workstation with GPU reconstruction capabilities
- CT acquisition software
- High precision rotational stage
- New X-ray tube and/or X-ray detector optional

3D Computed Tomography Performance Upgrade

Benefits

- Increased reconstruction speed (up to 50x faster) = Increased Productivity
- Extremely easy to use CT software = Increased Productivity
- Higher resolution results with less noise = Increased Inspection Capabilities/Quality Control



Typical package includes:

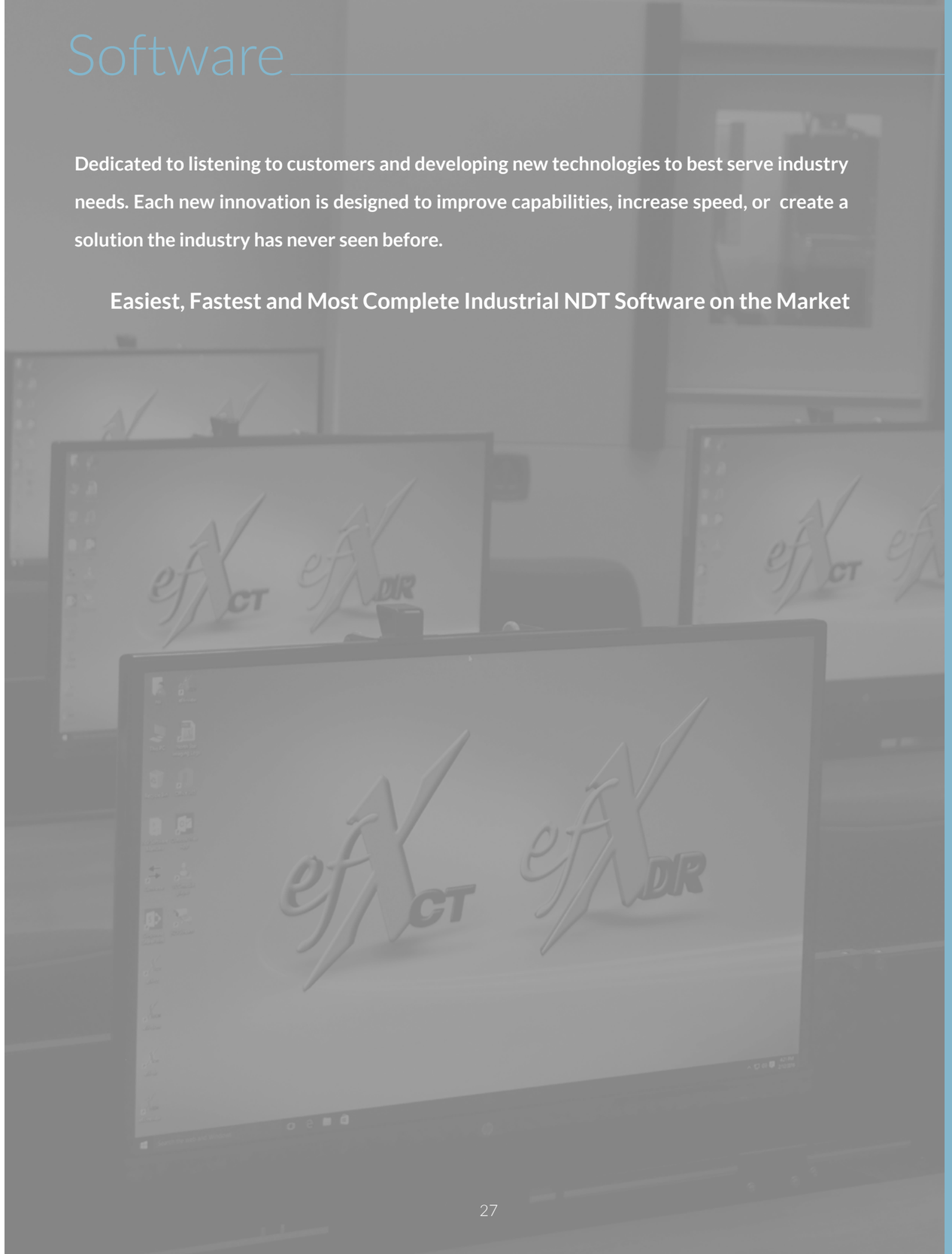
- efX-CT Software - includes geometry definition, reconstruction and 3D visualization
- CT workstation with GPU reconstruction capabilities
- Advanced 3D Analysis Capabilities - Geomagic/VGStudio MAX/Avizo.
- New X-ray tube and/or X-ray detector optional

NOTES

Software

Dedicated to listening to customers and developing new technologies to best serve industry needs. Each new innovation is designed to improve capabilities, increase speed, or create a solution the industry has never seen before.

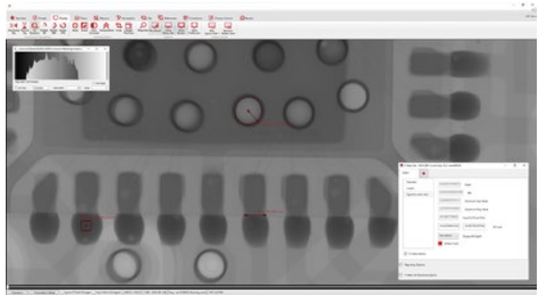
Easiest, Fastest and Most Complete Industrial NDT Software on the Market



Software

Next Generation DR Software Developed Entirely by North Star Imaging. Exclusively featuring:

- High performance GPU driven image processing and measurement
- Automatic creation of customizable Technique sheets for operator records
- Easy CT acquisitions: continuous or step, Fan Beam, Cone Beam, vorteX
- Enhanced detector capabilities: larger size (mosaiX) or improved resolution (subpiX)
- Seamless integration with efX-CT software
- DICONDE compliant
- Automated program execution triggered by barcode (or similar) input



efX-DR IMAGE PROCESSING SOFTWARE:

- Windows® based
- Non-proprietary image storage format (TIFF)
- High performance GPU image processing and measurement
- Live averaging
- Live histogram with multiple color tables
- Live line profile
- Live rotation between portrait and landscape modes
- Live measurements
- Live image offset and multiple gain calibration, defective pixel correction
- Live signal to noise and live contrast to noise measurement
- Filters to improve image quality
- Automatic creation of customizable Technique sheets for operator records
- Capture video into AVI files
- Supports digital flat panel detectors, LDA's and digital/analog cameras at 8, 10, 12 and 16-bit
- Supports multiple X-ray sources
- Read and store images in TIFF 32-bit / 16-bit / 8-bit, BMP, JPEG, DICONDE
- Seamless integration with efX-CT software
- Teach and learn based motion programming
- Optional Production Mode with barcode input and automated system operation

OPTIONAL DETECTOR QUALIFICATION MODULE:

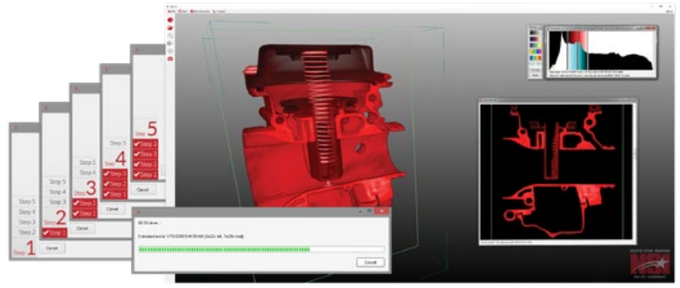
- ASTM 2597, 2737 and BSS 7044 Rev B. specifications
- Simplifies reporting process to meet above guidelines
- Simple SRb calculation

efX-DR WORKSTATION:

- Windows® based
- Intel® Xeon® Processor
- 8 GB RAM
- 1 TB SATA High-Speed Hard Drive
- 10/100/1000 network interface card
- 30 inch high resolution flat panel monitor

The Easiest, Fastest and Most Complete Industrial CT Software on the Market. Exclusively featuring:

- GPU accelerated CT reconstruction module
- Automatic Parallelization for systems with multiple GPUs
- 5-step guided wizard for easy CT reconstruction
- Intuitive interface and OpenGL based 3D volume rendering
- Unique geometry definition independent of system/mechanical precision
- Non-proprietary data formats, handles broad range of input formats



efX-CT PACKAGE INCLUDES:

- Full software license
- High-end, multi-processor CT reconstruction and 3D visualization workstation
- Complete user guide, documentation and geometry tools

efX-CT SOFTWARE INCLUDES:

- User friendly interactive volume viewer
- 2D Viewer: efX-view for X-ray images and CT slices
- CT slices stack import
- Compatible 2D formats include BMP, TIFF, DICOM, DICONDE and most standard formats
- Automated focal spot drift compensation
- Volume format conversion capabilities
- Advanced CT mode for full access to all CT reconstruction parameters
- Filters on projections for noise and artefact correction
- Unique ultra-fast 3D preview of CT reconstructions
- Region of Interest CT reconstruction
- Job list – process all CT reconstructions in a queue
- Interactive density segmentation
- Real time multi-slicing (up to six planes) with measurements
- Volume resizing, cropping and reorienting
- Imperial and Metric measurement systems
- Beam hardening correction
- Surface extraction with export to STL, OBJ, DXF, WRL, PLY, etc.
- No limitation in reconstruction size and resolution
- Easy screen capture, video recording and exporting of x/y/z slices
- Easy repeat scans - configure once, reconstruct multiple
- Production Mode with automated reconstruction

efX-CT WORKSTATION:

- Windows® based
- Reconstruction Modules:
  - Conventional Cone-Beam (FDK)
  - vorteX
  - subpiX
  - mosaiX
  - Fan-Beam

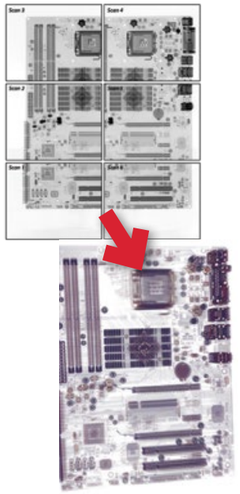
OPTIONS INCLUDE:

- GPU acceleration package with NVIDIA hardware
- High capacity high speed storage with hardware RAID support
- Geomagic, VGStudioMAX and/or Avizo software packages for advanced data processing/analysis

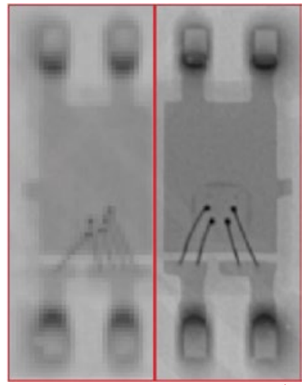
Software Innovations

mosaiX

mosaiX utilizes a combination of hardware and a proprietary software algorithm to stitch multiple images forming one seamless image with a much larger field of view. With mosaiX the effective imaging field of view is no longer limited by the detector panel size, and can now be expanded as large as the cabinet will accommodate. Another advantage is that you can increase the magnification factor well beyond what is possible with standard imaging.



Large Circuit Board

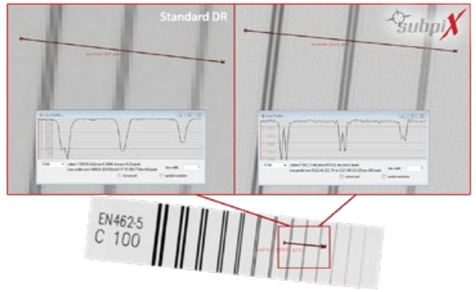


Conventional CT mosaiX

subpiX

subpiX uses a combination of hardware and a proprietary software algorithm to generate images with improved resolution that is typically double of what the detector alone is capable of achieving.

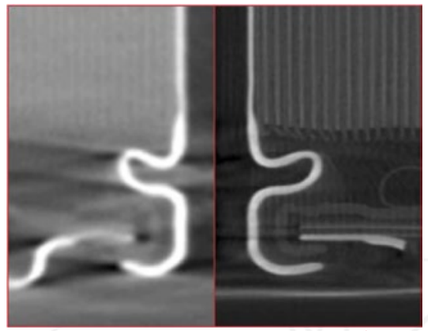
Line Pair Gauge



vorteX

vorteX is a computed tomography technique that allows you to scan elongated objects that cannot fit into a single exposure, thus enabling higher magnification and increased resolution. The other major benefit of vorteX is the elimination of cone beam artifacts, which are usually seen at the top and bottom of conventional CT scans that use short focal distances or wide cone angles.

AA Battery

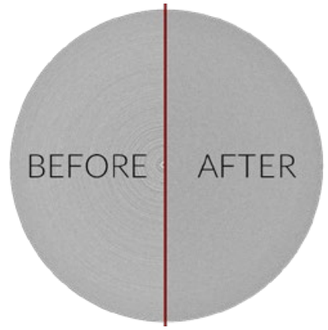


Conventional CT vorteX

(cone-beam artifacts reduced)

ringReduction

Ring Reduction utilizes a combination of hardware and a proprietary software algorithm to compensate for the irregular response of the detector pixels during a CT scan. This increases quality by reducing artifacts that can mask indications or be misinterpreted as an indication. Also, it can improve volume surface quality. These benefits do not cost any additional time than a standard scan done without Ring Reduction.



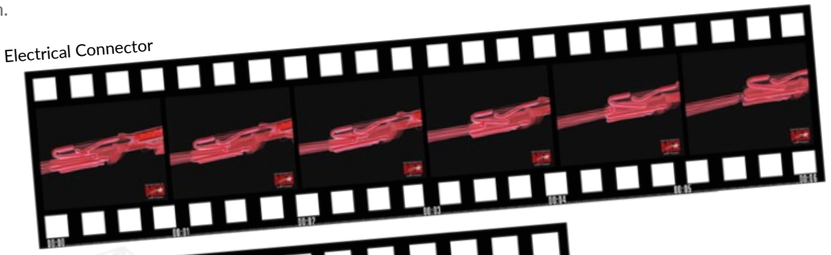
AutoReconstruct

Automatic Reconstruct is used when the same types of parts are being scanned repeatedly. This feature automatically processes the CT projects after each scan is completed. In the first scan, the software is “taught” what the parameters and settings should be and it remembers that information for the next 10, 100 or infinite number of parts.

4D CT

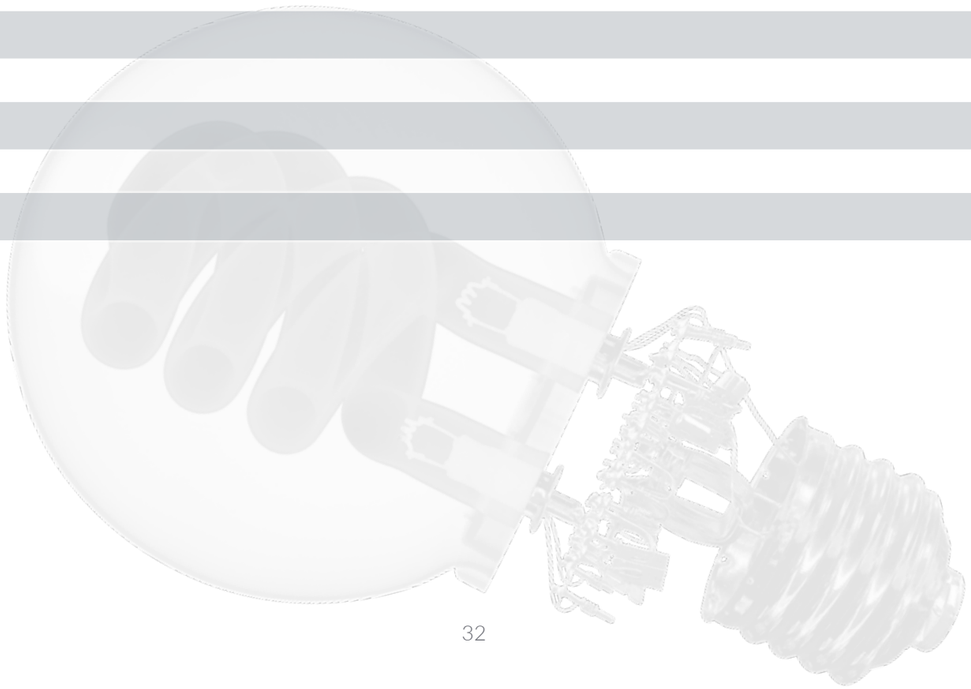
4D X-ray Computed Tomography allows users to reconstruct a complete 3D CT model that includes time and motion, creating a truly dynamic volumetric dataset. Because this is an X-ray Computed Tomography process, both the internal and external structures of an object are obtained. This new and exciting technology makes it possible to study form, structure and now – function.

Electrical Connector



Battery Short Circuit

NOTES



Inspection Services Group

The Most Advanced X-ray Inspection Laboratory in North America

North Star Imaging's Inspection Services Group provides real-time X-ray inspection and CT scanning services to virtually anyone needing to verify the integrity of internal components. The "inside view" that our team produces is unparalleled in the industry and is the foundation for all of the services that we provide. When you need high accuracy examination of internal components or wish to inspect the dimensions of any assembly, call on NSI's Inspection Services Group. No other company offers a broader range of services or the depth of nondestructive testing expertise.

Inspection Services Group

Applications Include:

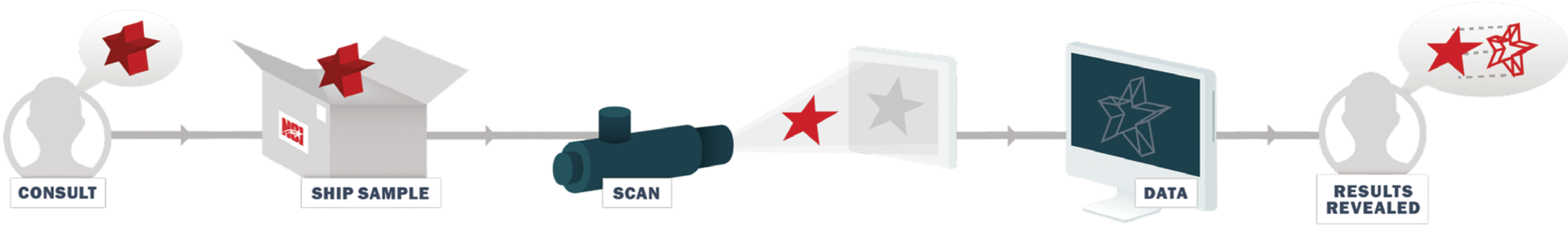
- Failure Analysis
- Reverse Engineering
- Density Analysis
- Product Quality Compliance/ Screening
- Internal and External Measurements
- Research and Development (R&D)
- Product Contamination
- 3D Metrology
- Museum Artifact Digitization
- Weld Quality Analysis
- Assembly Verification
- CAD Comparison

You can be assured that NSI's support team for the Inspection Services Group is always on top of their game. We needed their support and everything went well, as usual. We were able to manipulate the scans and gather the information we needed. We appreciate their quick turnaround in processing and as always their excellent customer service.
– CT Customer, Medical

xrayinspectionservice.com

Electronics | Castings | Automotive | Aerospace | Medical Devices | Additive Manufacturing | Military & Defense | Dental | Manufacturing | Plastics

Inspection Services Group



1. CONSULT:
Consult our application specialists to develop a plan of action.

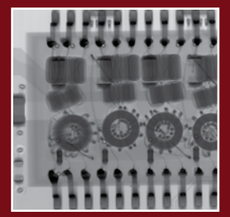
2. SHIP SAMPLE:
Ship your product to any of our worldwide locations.

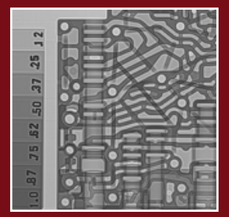
3. SCAN:
Whether it's 1 or 1000, big or small, we can scan it all.

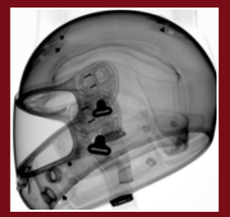
4. DATA:
Rotate, virtually cross section and measure your part with our viewing software.

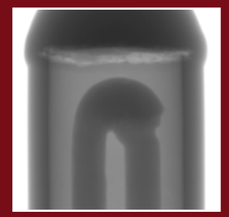
5. RESULTS REVEALED:
Join us for a web meeting or visit our facility to answer your questions.

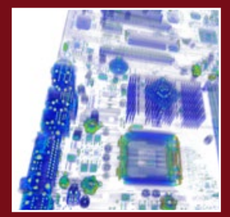

Sports Equipment


Electronics


Castings


Safety Devices


Sensors


Circuit Boards


Plastics


Assemblies


Rubber


Power Equipment

NOTES

NSI's customer service is exceptional -- When I have had to call for assistance everyone has been very helpful and goes above and beyond". We're extremely satisfied with the products/services provided by North Star Imaging from their Inspection Services, to the software application used for scanning. Their products/services make our job so much easier. The scans are easy to read, clear, and provide incredible detail.

– CT Customer, Oil and Gas

Services

The use of X-ray techniques to inspect the integrity of industrial products dates back to the turn of the century. As the industrial world continues to evolve, the technology improvements associated with the creation of the X-ray image, and modern computer hardware and software improvements, are allowing the X-ray imaging process to be carried out at higher speed and higher resolution. The result is higher efficiency, improved quality, and reduced overall manufacturing and operating costs.

Today, not only do we rely on the continuous development of new imaging technology and design innovations on the industrial X-ray system to increase product quality and performance, we also depend on them to achieve planned production capacity and manufacturing throughput. Equipment uptime in general, has becomes one of the most critical KPIs/Key Performance Indicators to measure manufacturing efficiencies today. In a highly competitive market sector, significant capital investments on equipment reliability and maintenance are required to manufacture goods of almost any economic significance.

The result of these investments can sometimes be a fundamental element of competition among companies and nations. Any event that slows or interrupts the manufacturing process or degrades equipment reliability, will impair the competitiveness of any manufacturing enterprise.

Services

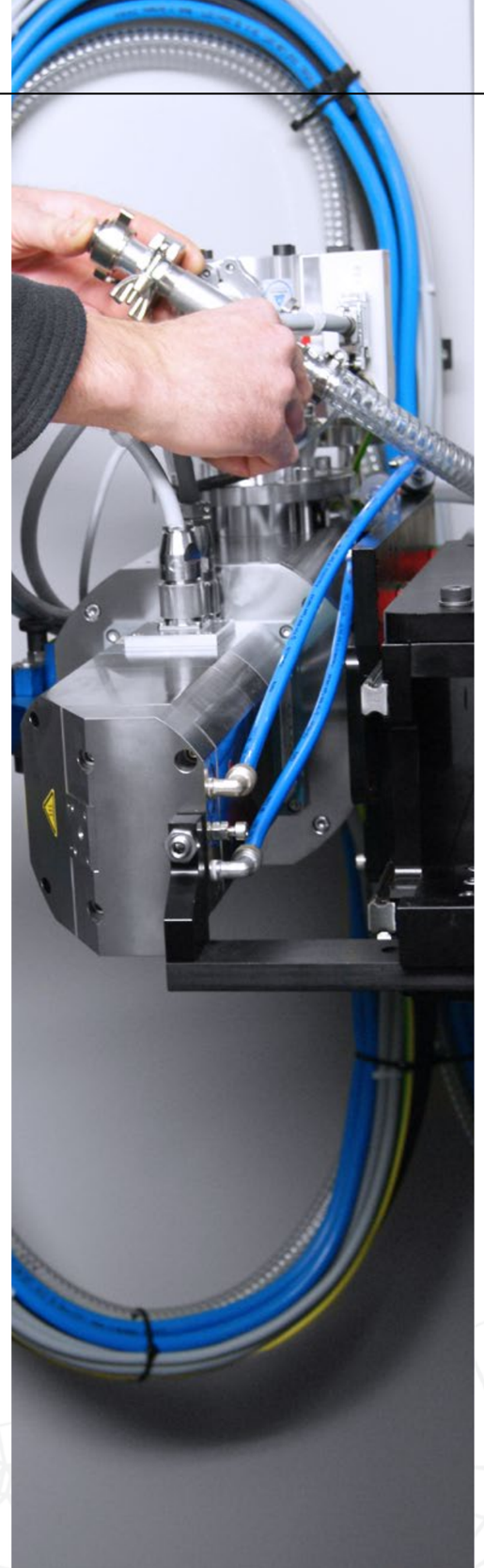
Preventative Maintenance Services

NSI has a Service Maintenance package suitable to any customer's needs. Our maintenance programs offer services that help prevent costly machine down-time and ensures consistent, worry-free equipment operations. Having the right preventative maintenance program can not only help identify unusual machine wear and tear, but also operator misuse which could result in premature equipment failure or safety issues.

Customers on Contract Receive:

- Guaranteed pre-paid services during the terms of the contract.
- Ability to plan for downtime with a pre-planned maintenance schedule.
- Preferential service scheduling over non-contract customers.
- Unlimited free phon or remote support
- Discounted pricing for parts and components purchase.
- Discounted labor rate for other services not include din the contract.
- Waived or discounted industry standard call-out fees.

"The Service Representative assigned to me by NSI was amazing. I have been singing his praises to everyone in my organization. I thought I knew everything when it came to our system, but NSI's technician knew so much more. I've compared him to Rain Man with the amount of knowledge he has!"
– Repair Visit Customer, Military



All preventative maintenance agreements include a 12 Point Inspection:

1. Clean and adjust X-ray Tubes, replace o-rings and adjust Controllers to manufacturers specs
2. Clean, inspect, set, compression and reapply dielectric grease
3. Vacuum system check and change oil if applicable
4. Clean cooler and test safety switches
5. Clean and verify adjustments on the HT generators to preserve tube filament life
6. Clean , inspect and lubricate manipulator
7. Test and Adjust shutter
8. Test and adjust Safety Interlocks and Safety Lamps
9. Test power and supplies and adjust to factory specifications
10. Inspect for proper cable drape
11. Verify cooler operation
12. Perform a Radiation Safety Survey with documentation

Services

Classroom Training

Technical training programs for Level I, II, and III technician certification in accordance with the American Society for Nondestructive Testing (ASNT), NAS 410, and other industry standards for certification in radiography methods. Training curriculum is designed with a combination of lectures, laboratory sessions and extensive handout materials providing a training atmosphere that's beneficial to all attendees.

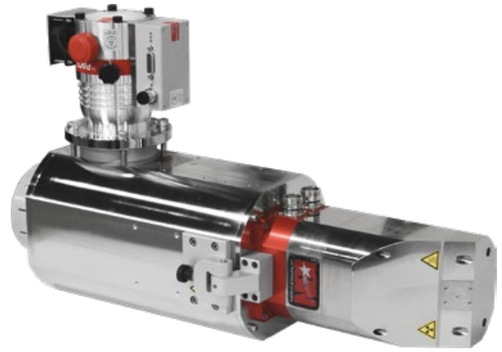
On-site Training

Convenient and cost effective training with factory trained and authorized system specialists.

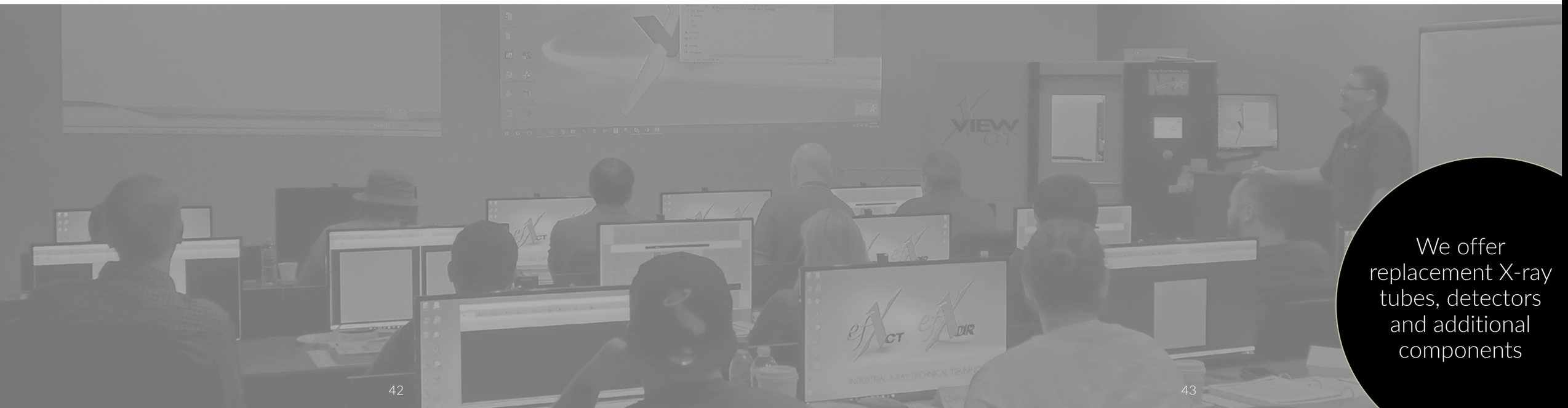
- New System operations training
- Configuration and Calibrations
- NSI efX-DR and efX-CT Software and supporting applications training
- Basic Maintenance Training
- Technique development specific to customers' parts/products

"Great course and well needed. Learned a ton to take back and put into use. The computer usage with full software capability is awesome"
- DR & Basic CT Cutsomer

Technical Service Offerings



- Repair Services
- Replacement or spare parts purchase
- Upgrades
- Custom application development or certification runoff support
- System Relocation
- Radiation Surveys
- Technique Development
- Software Maintenance Contract



We offer replacement X-ray tubes, detectors and additional components