



**VisiConsult**  
X-ray Systems & Solutions

# VisiConsult X-ray Systems & Solutions GmbH

High efficiency through a combination of CT and ADR for in-line inspection systems

Lennart Schulenburg  
Director of Sales and Marketing

# About VisiConsult



**VisiConsult**  
X-ray Systems & Solutions

- 60 employees worldwide
- Located in Northern Germany: Stockelsdorf
- Family owned business (second generation)
- ISO9001 certified processes
- Development, manufacturing and service

## Milestones

- 1996 VisiConsult founded by Mr. Hajo Schulenburg
- 2003 located at Technikzentrum Lübeck
- 2010 own site in Stockelsdorf (360m<sup>2</sup> office, 500m<sup>2</sup> workshop)
- 2015 additional production area (850m<sup>2</sup>)
- 2016 subsidiary opened in Atlanta, US
- 2016 additional production area and office (1000m<sup>2</sup>)

## Hajo Schulenburg pre VisiConsult from 1996 – 2002 at Seifert (now GE):

- Software development: SABA, Vistaplus, Vistaplus II, Vistaplus III
- Mechanical systems: Xcube, DP351, DP600, Custom systems

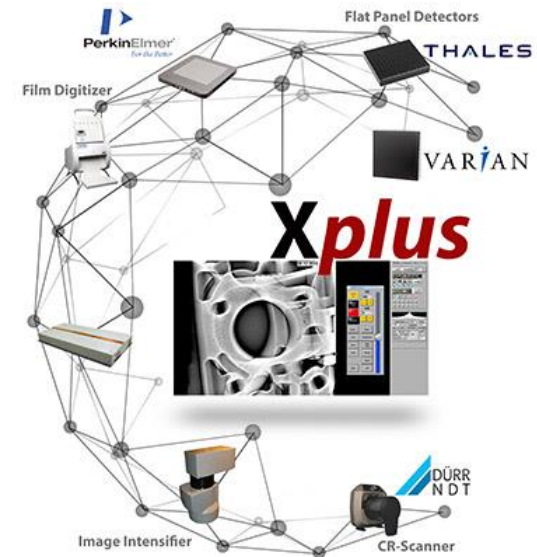


# Multi-device philosophy



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- Generic inspection framework
- Interfaces all common NDT hardware
- Flexible Plug & Play connection
- Support all manufacturers on the market
- Component choice based on application



## Component examples:

- Digital Detectors (FPD / DDA): Perkin Elmer, Varian, Thales, Rayence, Dexela, Hamamatsu
- Film Digitizers (RT): Vidar, Array
- Image Intensifiers (II): Siemens
- Line Detector Arrays (LDA): NTB, Hamamatsu, Thales
- Computed Radiography (CR): Dürr NDT

# Xplus – Imaging software

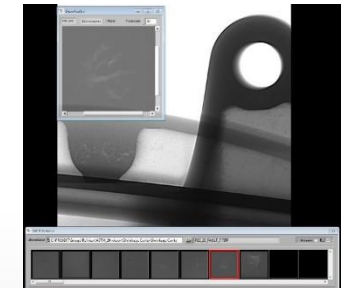
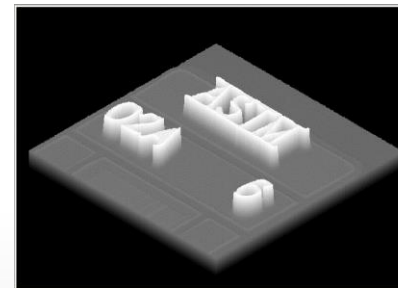
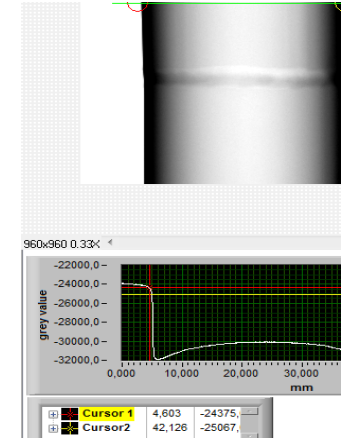
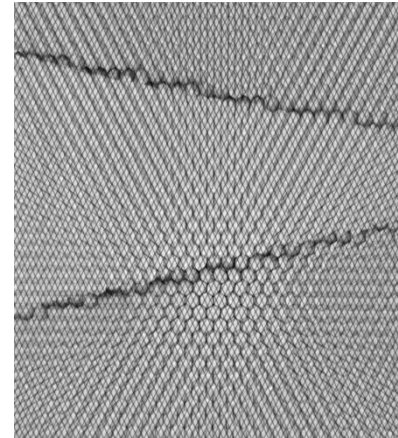


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- Image processing and archiving
- Comprehensive enhancement filters
- Measurement and Overlay tools
- Live image enhancement
- Archiving through DICONDE or reports

## Optional modules:

- Automated Defect Recognition (ADR)
- ASTM catalogue
- Computed Tomography (CT)
- Digital Video Recorder (VCR)
- Boeing and NADCAP Toolbox
- Automatic wall thickness measurement

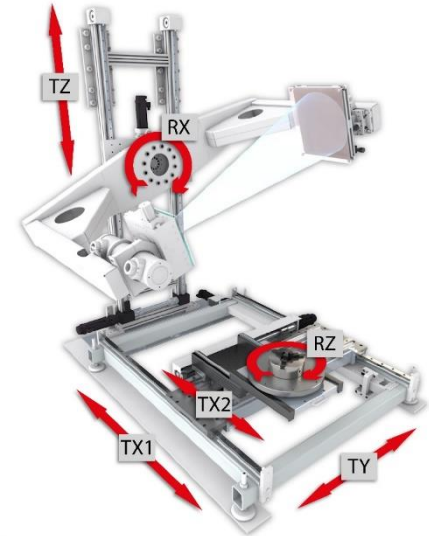
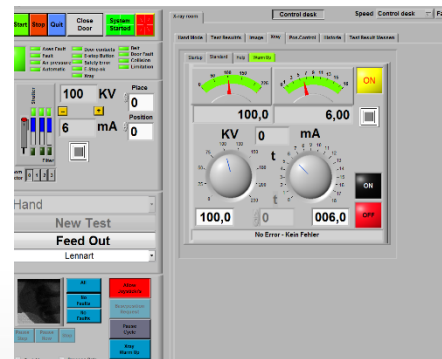
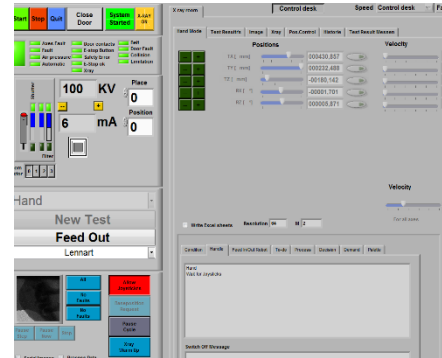


# Xplus Handle – Control suite



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- Control of all system hardware
- Direct generator interface
- Comprehensive CNC programs
- Definition of inspection sequences
- Clean display of all safety signals
- Control of CT and ADR features
- Deeply connect to *Xplus*
- One software for all systems





# Standard cabinets



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450 kV kg A DR CT XL

## **XRH222** TL

- 600kg heavy duty manipulator
- Loading by crane through roof
- Optional CT and ADR modules
- Full automation features
- Designed for big and heavy parts



450 kV L A DR CT

## **XRH222**

- Universal inspection cabinet
- Designed for big parts
- Optional CT and ADR modules
- Full automation features
- Most sold system worldwide



225 kV M A DR CT

## **XRH111**

- Universal inspection cabinet
- Designed for medium parts
- Optional CT and ADR modules
- Full automation features
- Compact layout and mobility



225 kV M

## **XRH111** ECO

- Visual inspection cabinet
- Budget entry level system
- Full image quality
- Full automation features
- Compact layout

# Roof mounted inspection



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**XRHGantry**



**XRHGantry CR**



- Roof mounted Gantry system
- Housed inside bunker or foldable cabinet
- Completely CNC controlled and ADR capable
- Part loading through fork lifter or rails
- Designed for big, heavy and complex parts
- Seven independent axes and pivot function
- Seven independent axes and pivot function
- Developed for aerospace (NADCAP certified)

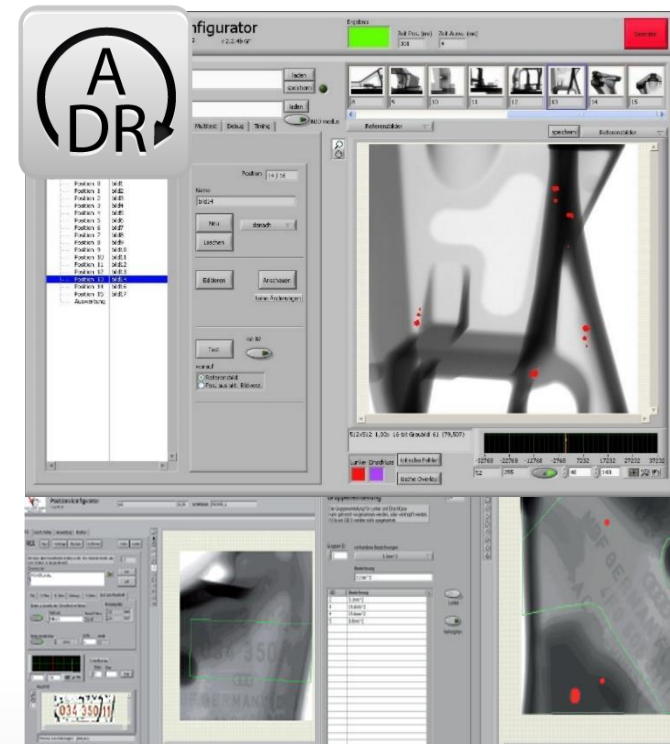


# Automated Defect Recognition



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- Automatic detection of defects
- Developed for high volume industries (especially automotive)
- Industry 4.0: RFID chips, Barcode or text recognition identification
- Automated archiving and overlays
- Offline configurator for high uptime
- Easy to customize and teach
- Intelligent noise reduction and image enhancement
- 25 years of experience and references





# ADR results



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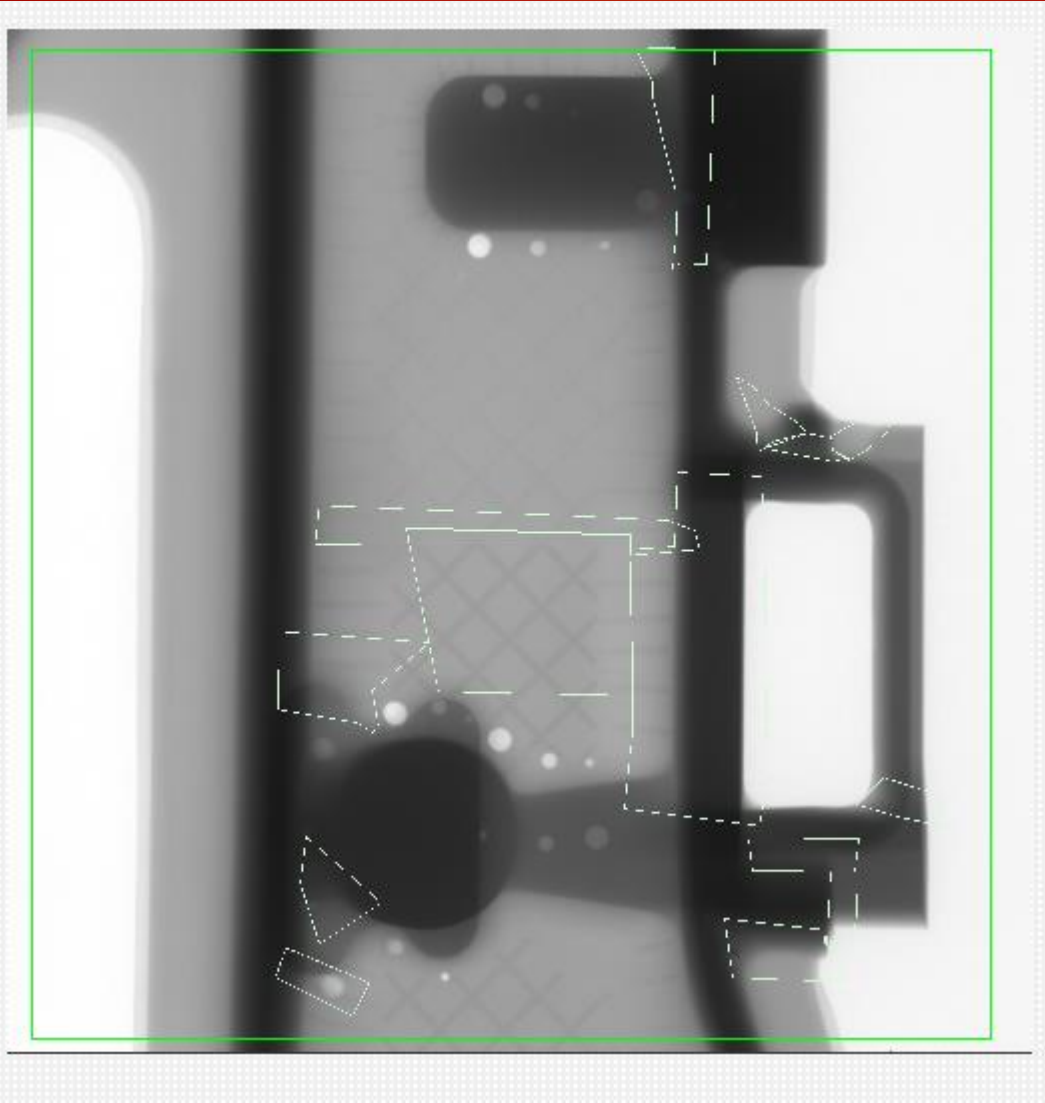
The screenshot displays the VAIP Offline Konfigurator software interface. The main window is titled "VAIP Offline Konfigurator" and includes a menu bar with "Datei", "Ergebnisse", "Ergebnisse 2", "Dateiliste", and "Multitest". The interface is divided into several sections:

- Header:** Shows the company logo (VisiConsult GmbH), the software name, version (v 2.7.2), and a status bar with "Ergebnis" (red), "Zeit Pos. (ms)" (1423), "Zeit Ausw. (ms)" (1), "Benutzer" (a), "Benutzerrechte" (service), and a "Beenden" button.
- aktuelle Konfiguration:** Includes fields for "aktuelle Konfiguration" (C:\Users\Hajo Schulenburg\Desktop\China\VAIP Demo\K1251\K1251) and "aktuelles Bildverzeichnis eines Werkstücks" (C:\Users\Hajo Schulenburg\Desktop\China\VAIP Demo\SerialImages\50). Buttons for "laden" and "speichern" are present.
- Navigation:** A row of buttons labeled "Konfigurator", "Ergebnisse", "Ergebnisse 2", "Dateiliste", and "Multitest". A "NIO modus" button is also visible.
- Left Panel:** A tree view titled "Werkstück" listing positions from 0 to 31. "Position 11" is selected. Below the list are buttons for "Neu", "Löschen", "Editieren", and "Anschauen".
- Right Panel:** A large image viewer showing a grayscale X-ray of a workpiece with red spots indicating ADR results. The viewer includes a "speichern" button and a "Bild A" dropdown.
- Bottom Panel:** A histogram showing the grayscale distribution of the image. Below the histogram are controls for "Lunker Einschluss" (red and purple), "kritische Fehler", and "lösche Overlay".

# ADR configuration - ROIs

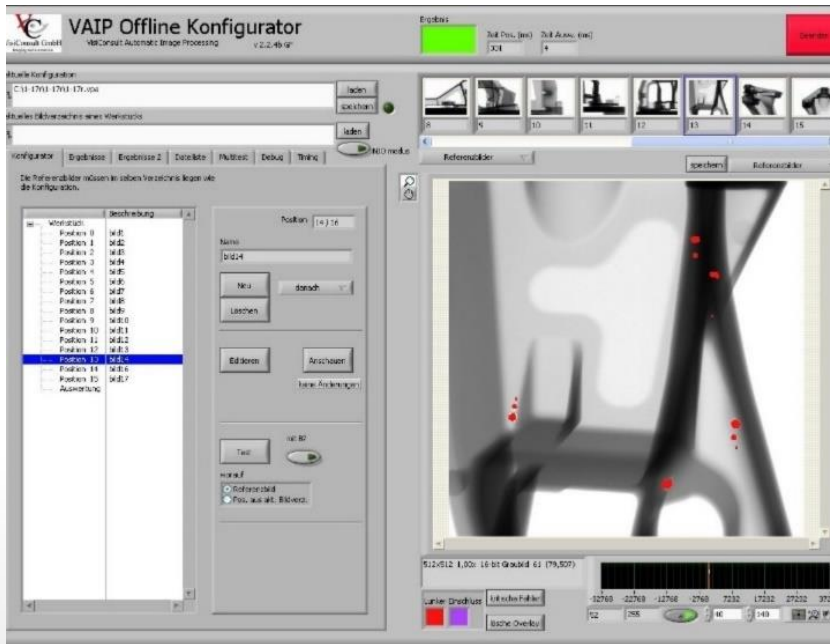


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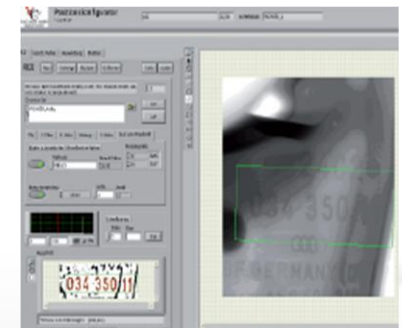
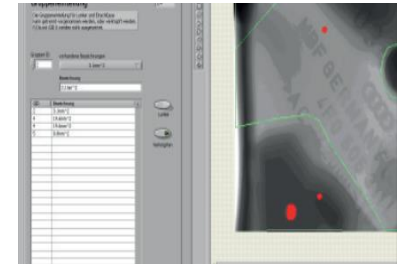


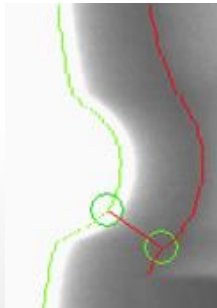
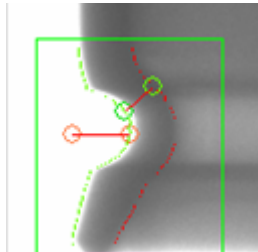
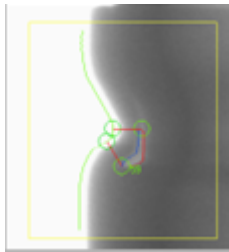
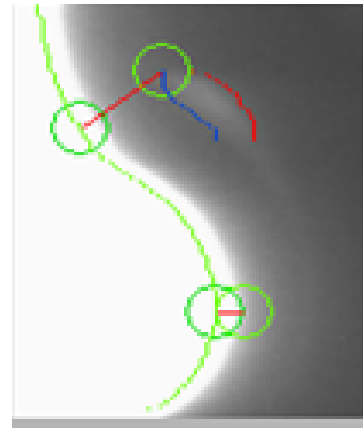
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- Porosities
- Inclusions
- Geometry
- Serialnumbers

- Approved by BMW
- Fastest ADR system worldwide
- 24/7 operation
- No human operator





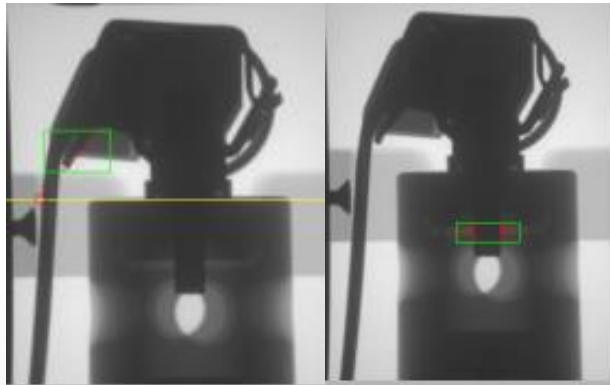
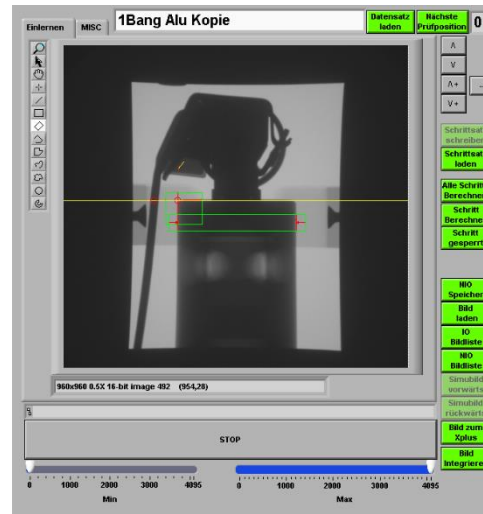
- Geometry
- Density
- Missing components
- Thickness
- Missing material and pores

- For airbag igniters
- Automation of DR cabinets
- 24/7 operation
- No human operator

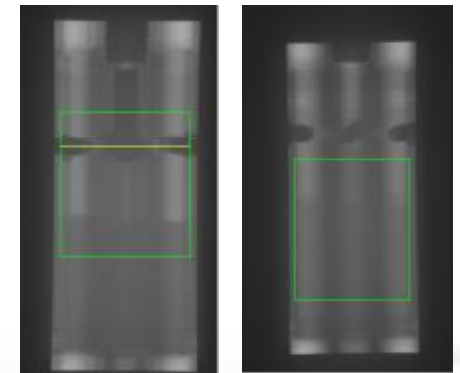




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- Foreign Material
- Missing components
- Wrong component
- Density
- Geometry

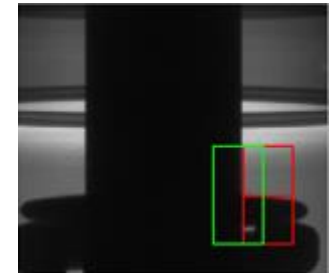




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- Foreign Material
- Missing components
- Wrong component
- Geometry
  
- Fully automatic
- Hundreds of checks
- Rotating device
- High voltage switches



# Inline CT

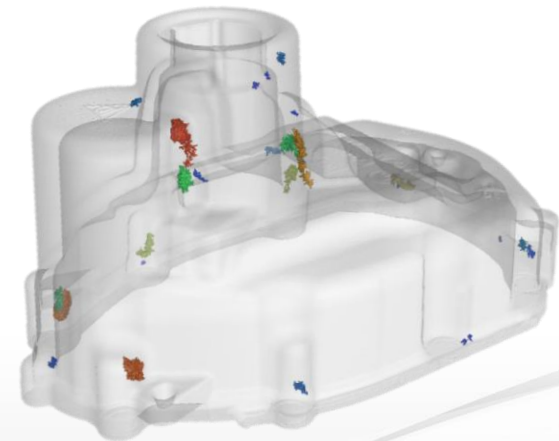


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- Modular CT option on most systems
- Fast reconstruction (<30 seconds) with the in-house developed QUICKscan
- 3D analyses: Reconstruction, porosity analysis, Actual-nominal comparison, wall thickness checks etc.
- Inline CT and full automation available
- Combined ADR and CT systems including 3D ADR
- Reconstruction clusters through VGInline
- Reference customers worldwide, demo system on control 2016 in Munich



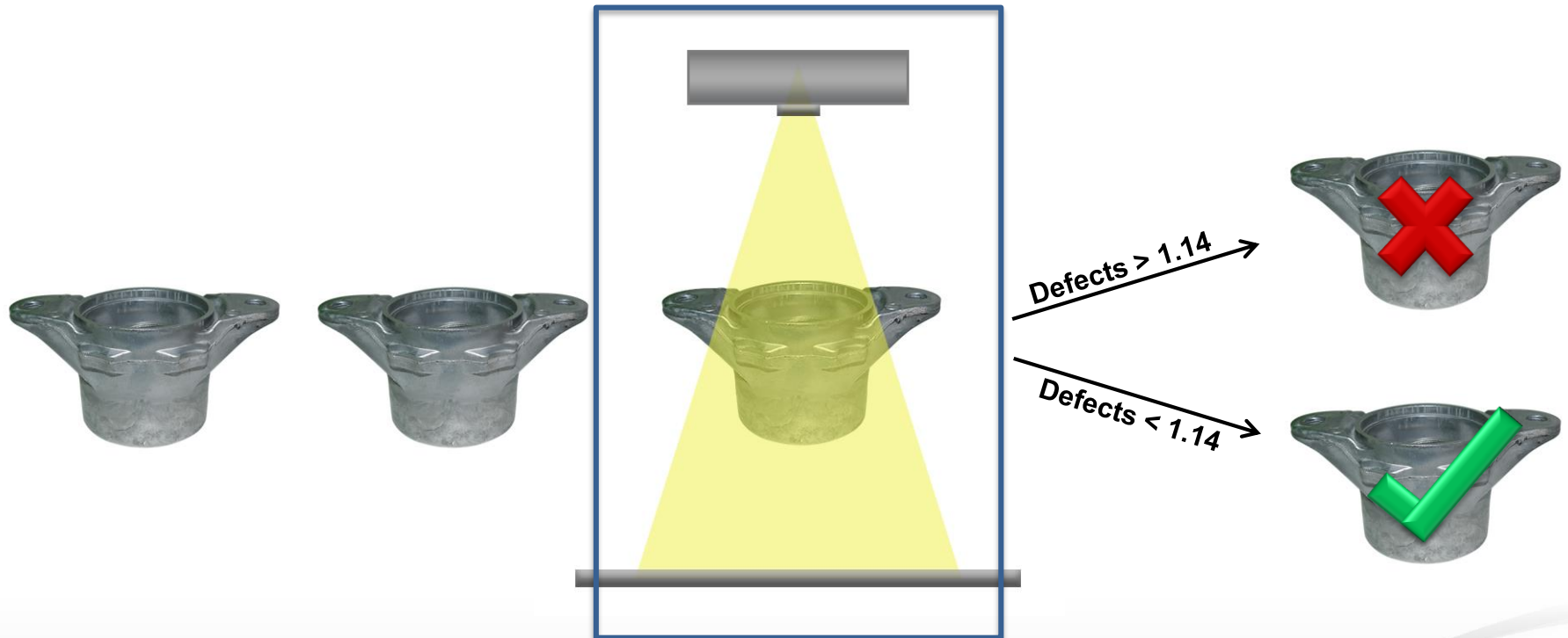
CT



# Inline CT



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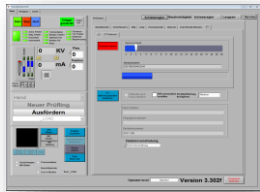


# Inline CT: Acquisition scheme

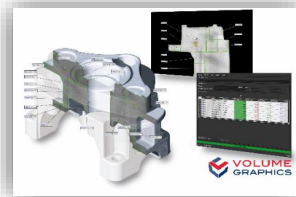


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- QUICKscan

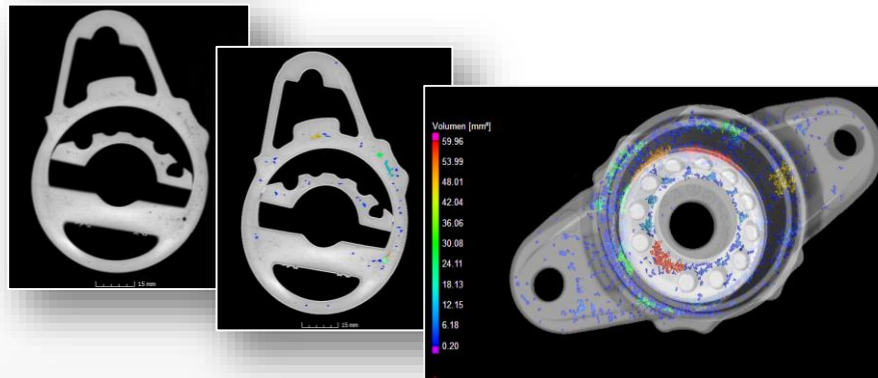
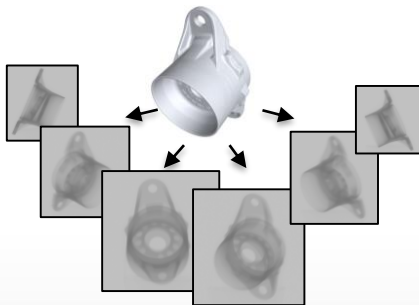


- Reconstruction and analysis



- Statistics and decision

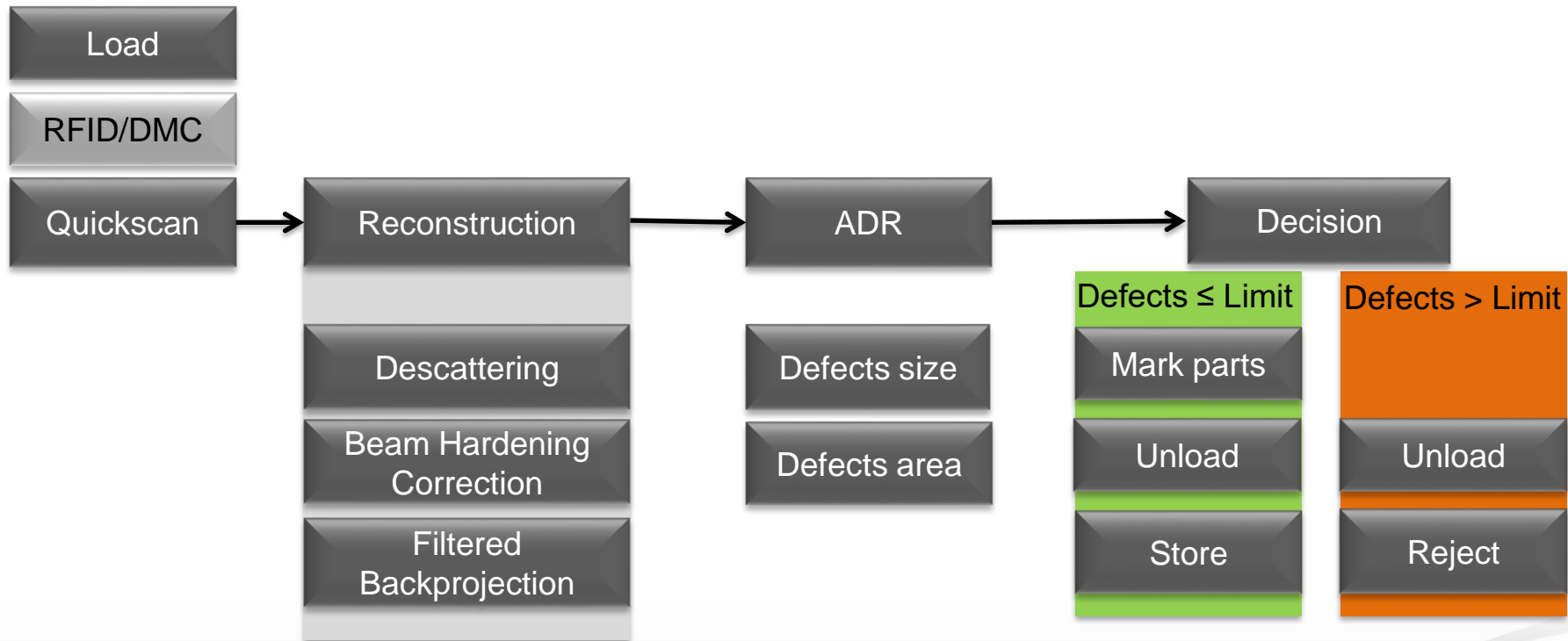
Material	
Materialvolumen [mm <sup>3</sup> ]	100654.29
Defektvolumen [mm <sup>3</sup> ]	1160.60
Verhältnis Defekte/Gesamtvolumen [%]	1.14



# Implementation of 3D-ADR



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**Automated process**

# Advantages of automation



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- Reduced labor costs
- Reduced chance of human failure
- Reduced cycle time
- Reduced downtime
  
- Higher throughput
- Higher efficiency
- Higher process safety
- Higher compliance to standards



# Customized solutions



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**XRHTower**

- Leading supplier of customized X-ray solutions
- Tailored towards process requirements
- Dozens of high-end reference systems
- From small customizations to complete systems
- Experienced engineering team
- Extensive consulting during concept phase



**XRH222** Pipe

**Don't adapt to the system! Let the system adapt to your process!**



**XRHTube**



**XRHPalette**



**XRH433**



# Thanks for your attention



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**Any questions or feedback?**



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