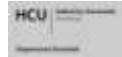


U N I S O N  
 Dienstag, 7. Juli 2009



## 3D Laser Scanning im Anlagenbau

www.Unison-Engineering.de  
 Email : unison@unison-engineering.de  
 Tel : (030) 78 79 53-0

Leandros G. Zeppos  
 Geschäftsführer

U N I S O N  
 Unison Engineering & Consultants GmbH

- Gegründet: 1994
- Standorte
  - Berlin
  - Köthen
- 30 Mitarbeiter

**Engineering - Anlagenbau**

Rohrleitungstechnik  
Stahlbau

- Project Management
- Basic Engineering
- Detail Engineering

**Laser Scanning 2001**

Industrieanlagen

- Scanning - Vermessung
- Dokumentation
- Reverse Engineering
- Scan Engineering Services
- Consultancy

U N I S O N  
 Laser Scanning im Anlagenbau  
 Referenzen

U N I S O N  
 Laser Scanning im Anlagenbau  
 Punktwolke

U N I S O N  
 Laser Scanning Engineering Services

**Laser Scanning Engineering Services**

- Vor-Ort-Scanning
- Unison Plantview
- 3D-Walkthrough / Design Review
- Engineering Analysis
  - Inspektion / Soll ist Vergleich
  - Kollisionsprüfung
- Dokumentation – Reverse Engineering
  - 3D-Modell (Microstation, Autocad, PDS, PDMS)
  - Aufstellungspläne
  - Rohrleitungspläne
  - Intelligente Isometrien
  - Materiallisten
- Training / Consultancy
- Engineering – Umbau / Erweiterungen

U N I S O N  
 Technology Acceptance

—2007- World Wide User Conference  
 San Ramon – CA – USA

- Increase in Quality (Hardware – Software – Workflows) – ISO 9001
- Development of Workflows specific to the Vertical Market
- Integration of Scanning in the Engineering Procedures
- Development of User Friendly Solutions
- Increase Usability - User Friendly Access to Point Cloud Data

UNION D N  
 Development of User Friendly Solutions  
 Increase Usability of Point Cloud Data

**Leica HDS**  
 -2007 World Wide User Conference  
 San Ramon - CA - USA

- Visualization
- Use of Color Panorama Photo Mapping
- Integration of Point Cloud Data in Design Review Sessions
- Use of Truview - Navigation Tool

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 Laser Scanning im Anlagenbau  
 Vor-Ort-Scanning



- 2 eigene Scanner mit sich ergänzenden Technologien und speziell angepasstem Equipment
- Arbeitsabläufe zugeschnitten für den Anlagenbau
- Ingenieurvermessung der Anlage (Registrierung)
- Fotorealistische 3D-Scans (photo mapping)

UNION D N  
 Laser Scanning im Anlagenbau  
 Panorama Photo Mapping



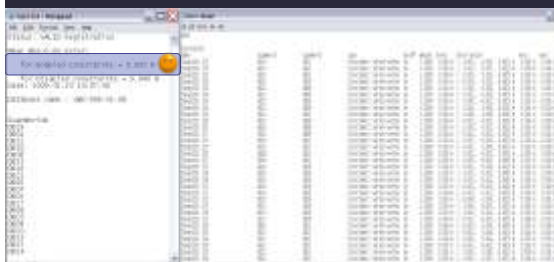

UNION D N  
 Laser Scanning Spezifikation

- Scan-Auflösung 6,3 mm bei 10m / 15,7 mm bei 25 m Punktabstand
- % Import 100 % Import
- Punktabstand 4 mm - 8 mm - 12 mm - 20 mm



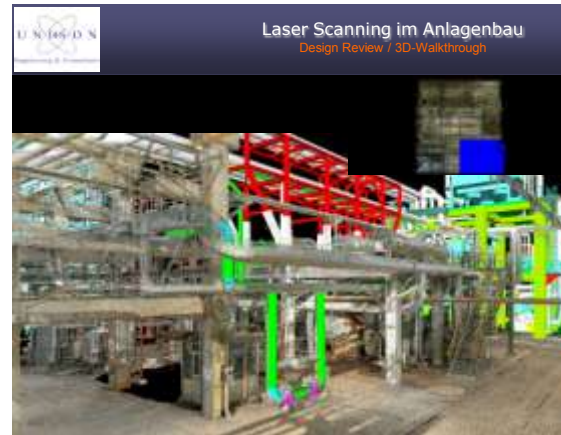
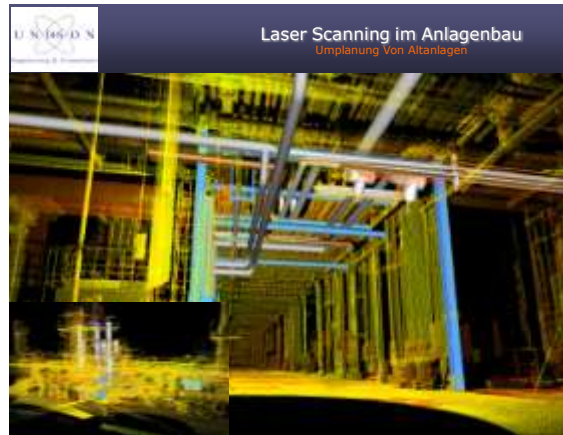

UNION D N  
 Laser Scanning Spezifikation

- Vermessung Kalibrierung - Target Konzept - Scan Positionen
- Registrierung Genauigkeit - Bericht

UNION D N  
 Laser Scanning im Anlagenbau  
 Umplanung von Altanlagen








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### Laser Scanning im Anlagenbau

Data Management

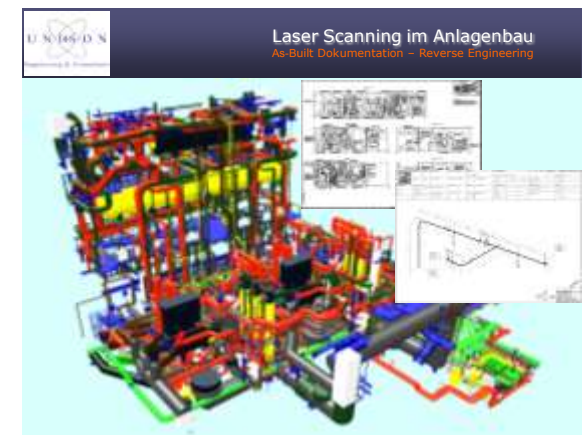


Engineering Projekt

- Umplanung – Revamp /Retrofit
- Engineering Analysis
  - Inspektion
  - Kollisionsprüfung
- As-Built Dokumentation – Reverse Engineering
  - 3D-Modell
  - Aufstellungspläne
  - Rohrleitungspläne
  - Isometrien
  - Materiallisten

CAD Software

- ✓ Microstation
- ✓ Autocad
- ✓ Inventor
- ✓ Revit
- ✓ PDS
- ✓ PDMS
- ✓ Smartplant 3D
- ✓ Tricad
- ✓ Triforma
- ✓ TEKLA Structures
- ✓ Bentley Structural
- ✓ Navisworks



**Laser Scanning im Anlagenbau**  
 As-Built Dokumentation - Reverse Engineering  
 Umplanung

This slide shows a 3D point cloud of an industrial facility, with various components highlighted in different colors (green, yellow, blue). Below the point cloud are several CAD models and drawings, illustrating the process of reverse engineering and planning.

**Laser Scanning im Anlagenbau**  
 As-Built Dokumentation - Reverse Engineering  
 Umplanung

This slide shows a 3D point cloud of an industrial interior, with a green floor and various pipes and structures. The point cloud is rendered in a semi-transparent yellow/green color, showing the internal structure of the facility.

**Plant Operation / Maintenance**  
 Laser Scanning Isometric Drawing Workflow

**Instandhaltung / Engineering**

- Intelligente Isometrien
- Rohrleitungsklassenänderung
- Materiallisten
- Neue Rohrleitungen

The diagram shows a workflow from a 3D point cloud to an isometric drawing. It includes the INTERGRAPH logo and a box labeled 'P&ID Spezifikation Anpassung' with an arrow pointing to the final isometric drawing.

**Plant Operation / Maintenance**  
 Geo-Tiff Workflow

The diagram shows a workflow from a 3D point cloud to a Geo-Tiff image, which is then used to generate a Microstation - Autocad drawing. The text 'Geo-Tiff' is written below the point cloud image, and 'Microstation - Autocad' is written below the final drawing.

**Plant Maintenance**

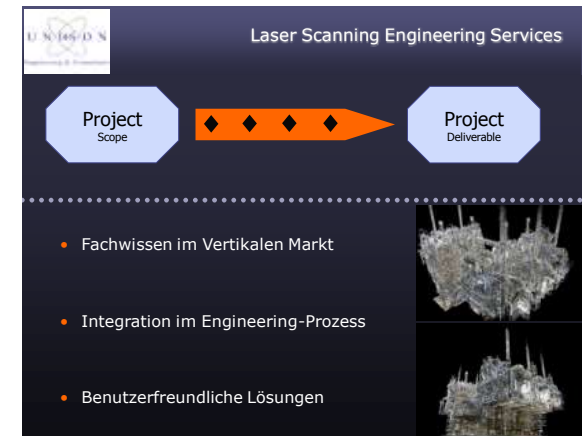
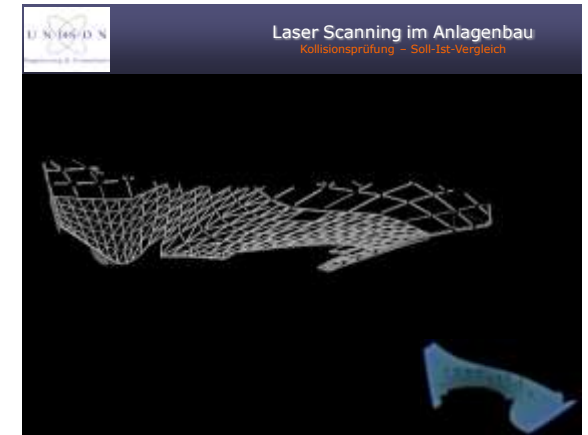
- As-Built Dokumente
- Draufsichten - Aufstellungspläne

**Plant Operation / Maintenance**  
 Geo-Tiff Workflow

This slide shows a Microstation - Autocad drawing of an industrial facility, with various components labeled and dimensioned. The drawing is a top-down view of the facility, showing the layout of pipes and equipment.

**Plant Operation / Maintenance**  
 Geo-Tiff Workflow

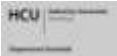
This slide shows an isometric drawing of an industrial facility, with various components labeled and dimensioned. The drawing is a 3D perspective view of the facility, showing the layout of pipes and equipment.





Laser Scanning im Anlagenbau

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