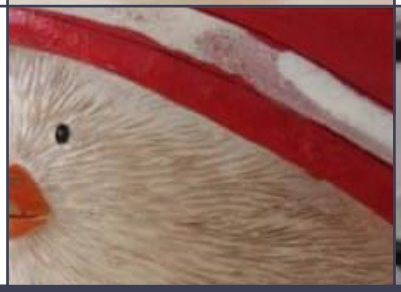
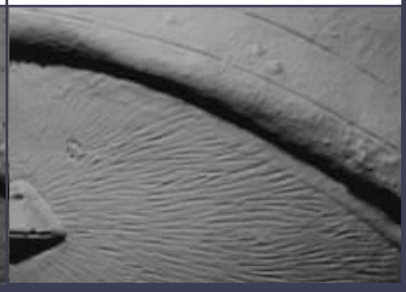
CENTERLINEDESIGN

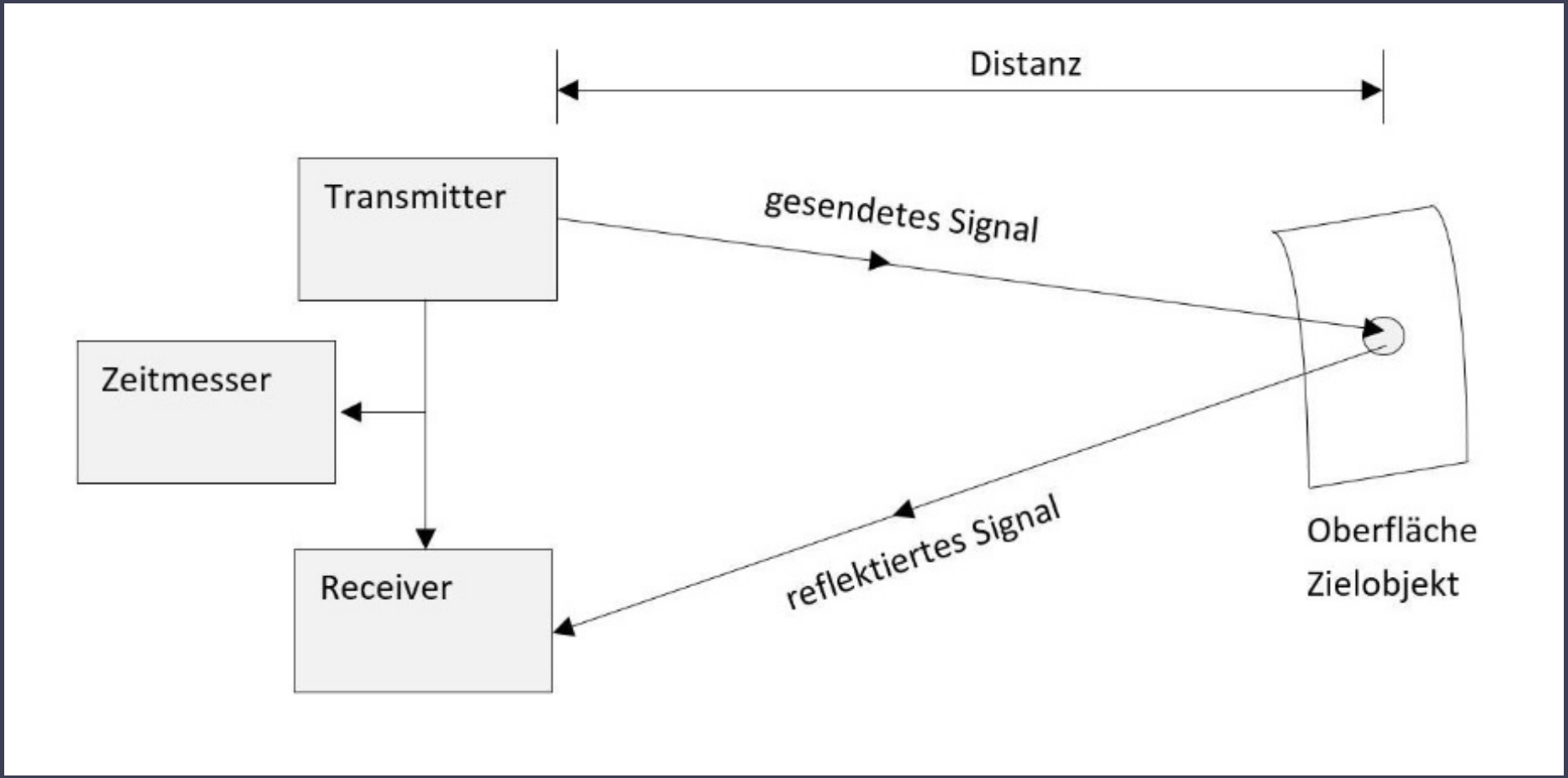
Digitale Transformation-

3D SCAN

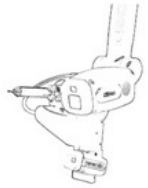
3D SCAN

	Original object	620K polygons	2.5 mil polygons	45.9 mil polygons
Overview				
Close-up				

3D SCAN FUNKTIONSWEISE



3D SCAN EQUIPMENT



MODELMAKER MMDX

ModelMaker MMDx features digital camera technology and Enhanced Sensor Performance of the 3rd generation to scan all sample materials and surface finishes. ModelMaker MMDx laser scanners come in 50, 100 and 200mm laser stripe widths, to suit every inspection need.

FARO SCANNER FREESTYLE3D

The FARO Scanner Freestyle3D provides a fast and easy to use scanning solution with verifiable accuracy of the 3D colour scan data. Moreover, the handheld 3D scanner maximises your productivity offering fast data acquisition, real-time visualisation and the largest scan volume on the market.

FOCUS3D X 130

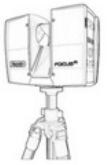
Focus3D X 130 is a mid-range device offering precise scanning up to 130m. The ultra-portable Focus3D X 130 enables fast, straightforward, and accurate measurements of objects and buildings. It records architectural façades, complex structures, production and supply facilities.

NIKON MCAX

The Nikon MCAx is a portable and extremely accurate articulated arm. It has a tactile probing performance from 0.023 mm and 7 axis. It can be ideally combined with the ModelMaker MMDx.

NIKON LASER RADAR

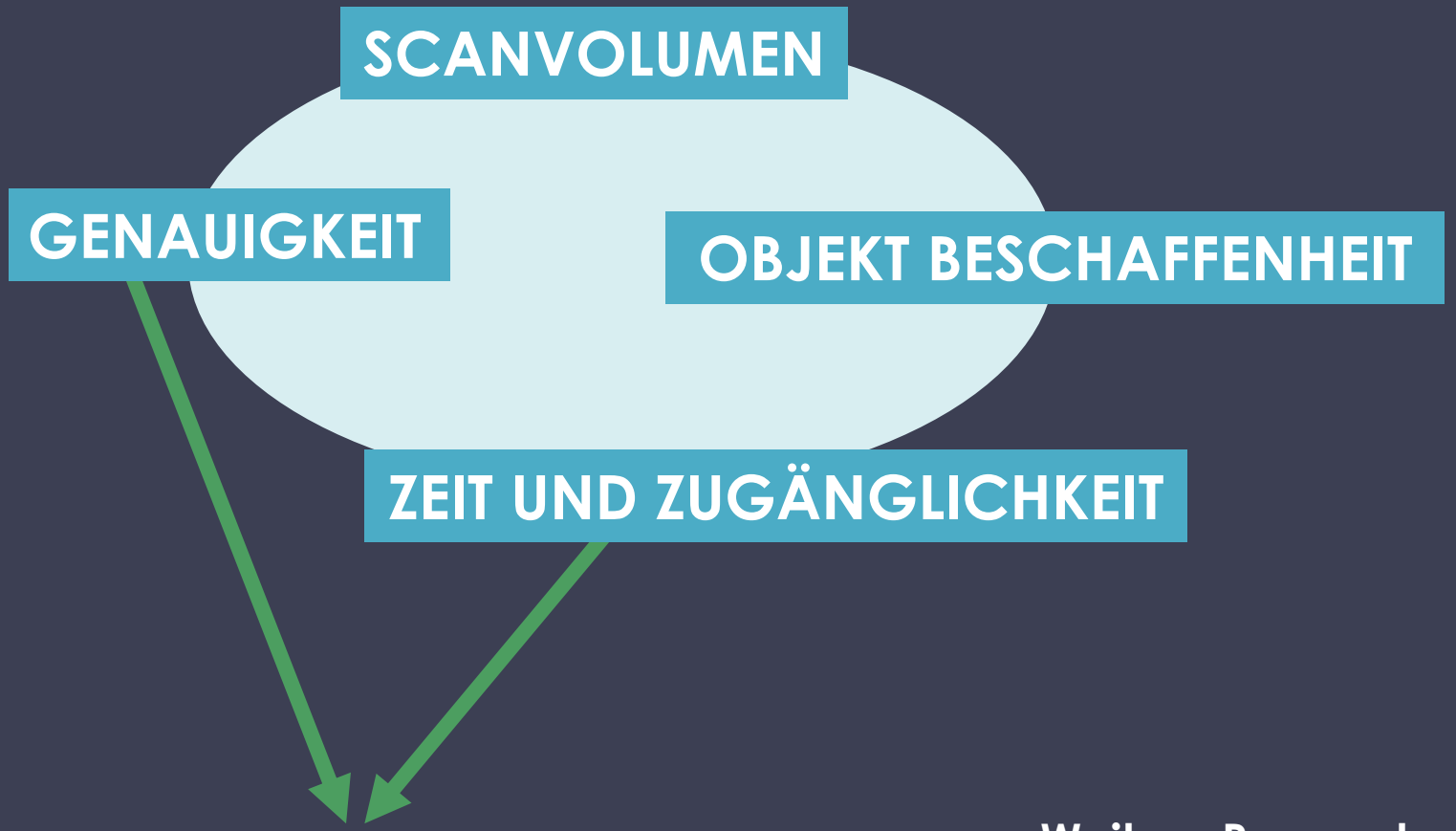
Nikon laser Radar is a large Area portable optical CMM. Contact free measurement by one user or support of programmed full automatic operation. Accurate measurement at micron accuracy.



FARO FOCUS 360

Faro 360 is a terrestrial laser scanner that collects dense points-clouds. It has a tolerance of 1 mm - 2mm and is especially designed for 3D documentation of very large elements such as buildings.

3D SCAN HAUPTPARAMETER



Weitere Parameter

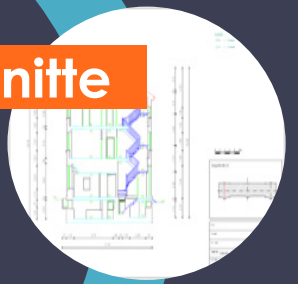
- Materialstärke, Materialart
- Netzverfügbarkeit

ARCHITEKTUR UND BAUWESEN

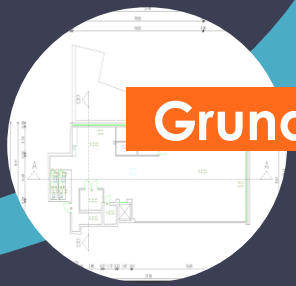
Scan-Daten

Visualisierungen

Viewer / Revison

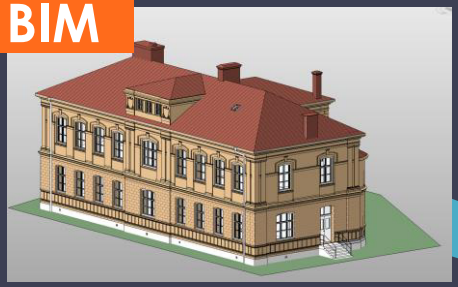


Schnitte



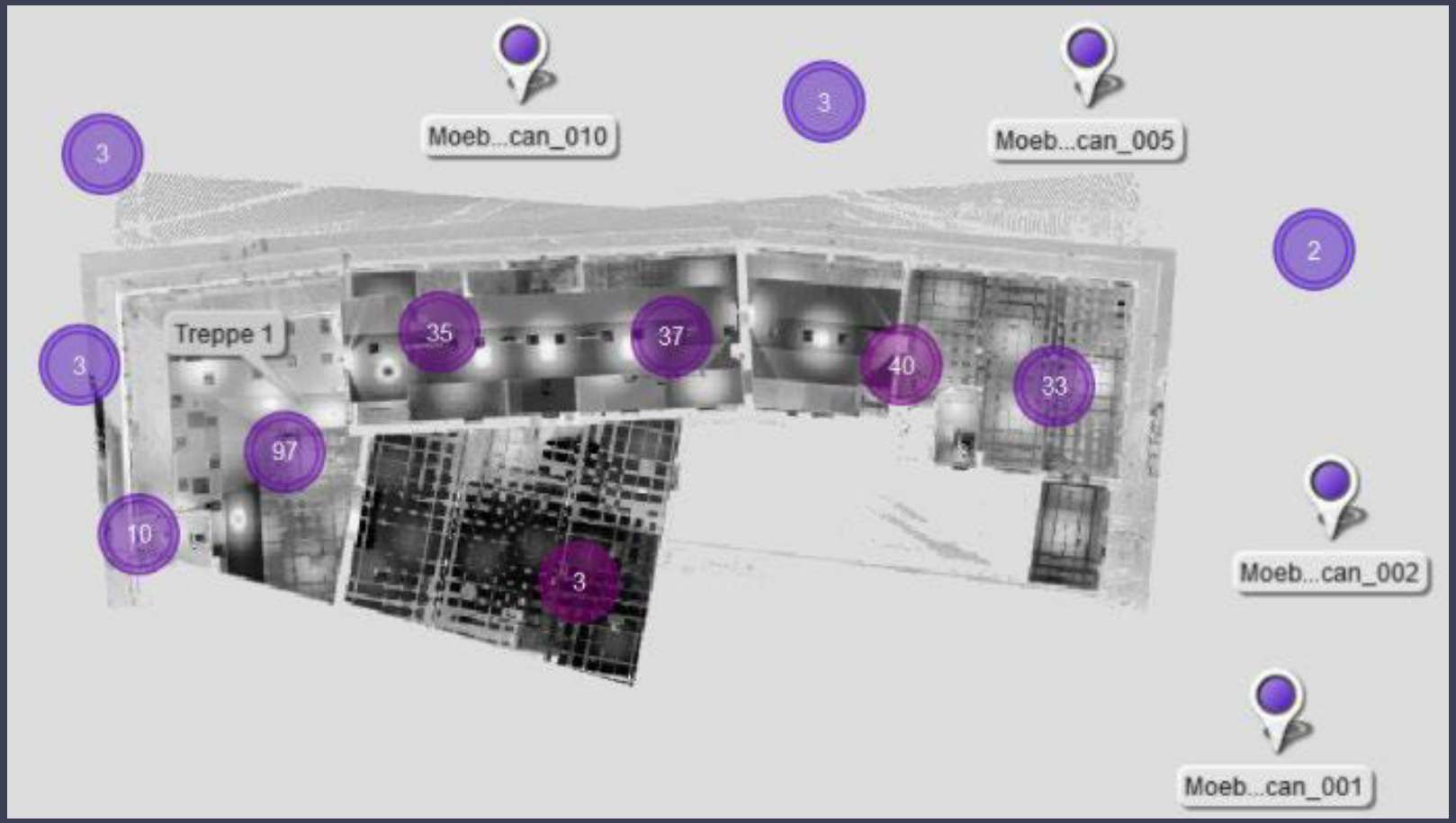
Grundrisse

3D-Ansichten



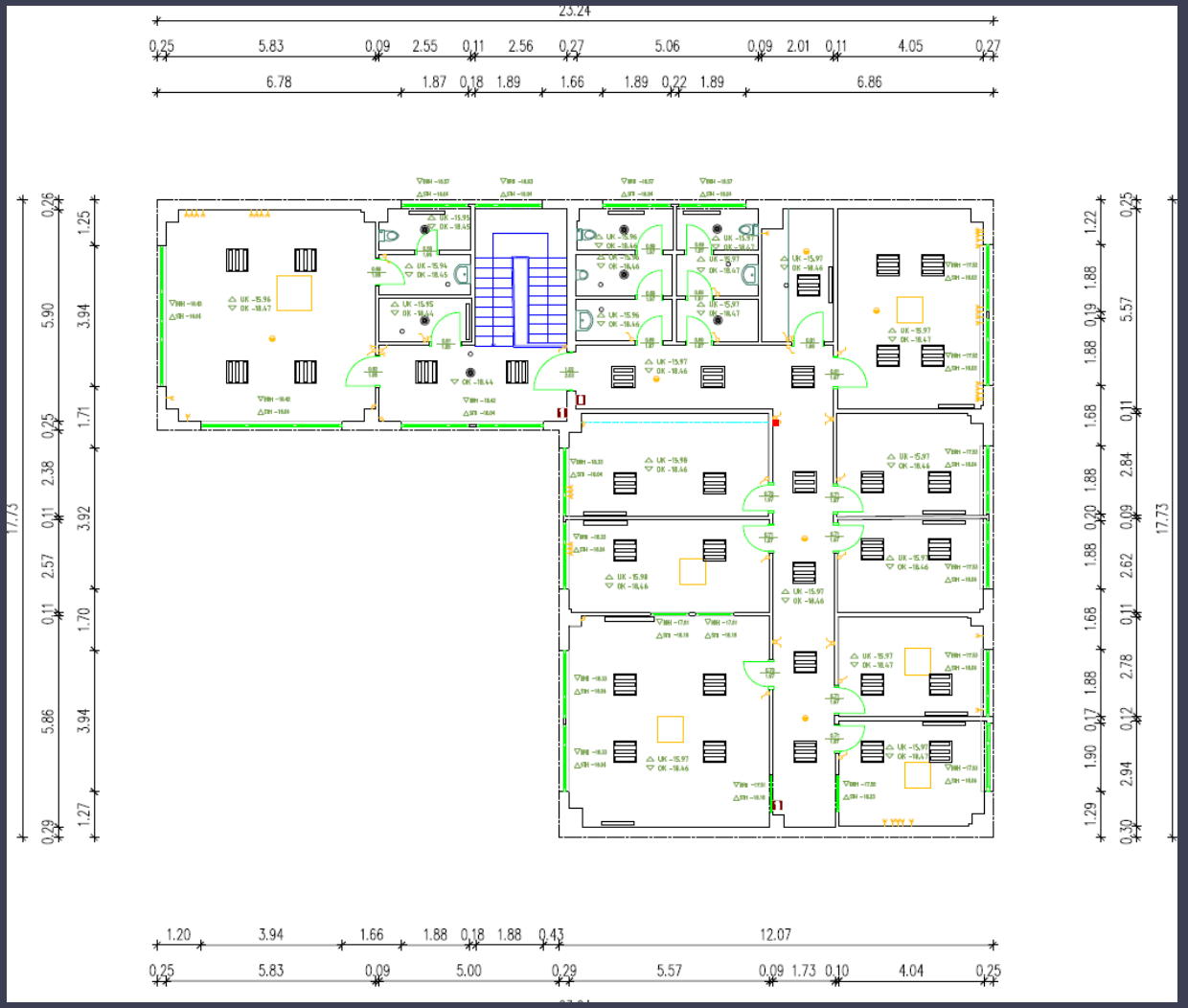
BIM

CLOUD



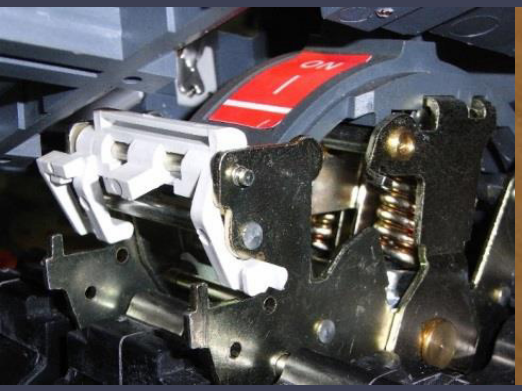
[WEBVIEWER – CLICK HERE]

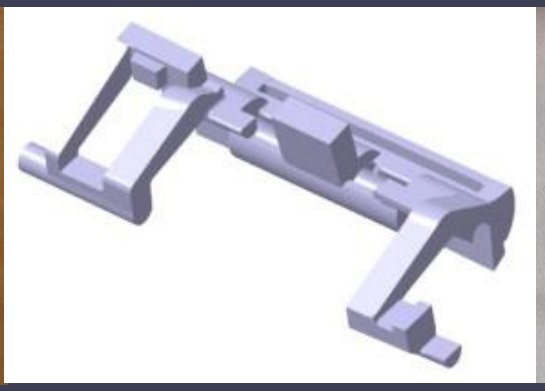
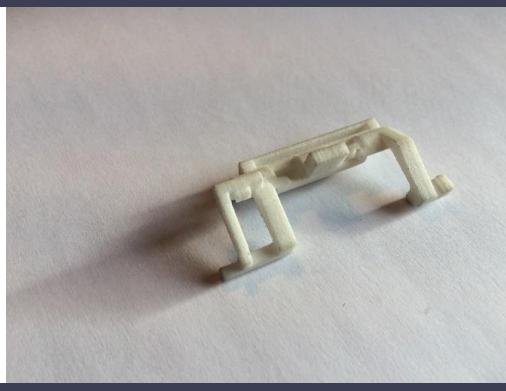
ZEICHNUNG


23.24
0.25 5.83 0.09 2.55 0.11 2.56 0.27 5.06 0.09 2.01 0.11 4.05 0.27
6.78 1.87 0.18 1.89 1.66 1.89 0.22 1.89 6.86
17.73
1.20 3.94 1.66 1.88 0.18 1.88 0.43 12.07
0.25 5.83 0.09 5.00 0.29 5.57 0.09 1.73 0.10 4.04 0.25

BIM / DIGITALER ZWILLING

3D DRUCKTEIL



- 3D-Scan, Modifications Scan to CAD
- Reverse Engineering
- Prototype and Testing
- 3D-Print
- Manufacturing from single part to mass production

A330 SIDEWALLPANEL / SEAT CLASH

CUSTOMER / PRODUCT

- Airbus A330 FAL

INITIAL SITUATION

- Sidewall panels clashes with the Backrest of the Seats

WAY OF WORKING / METHODOLOGY

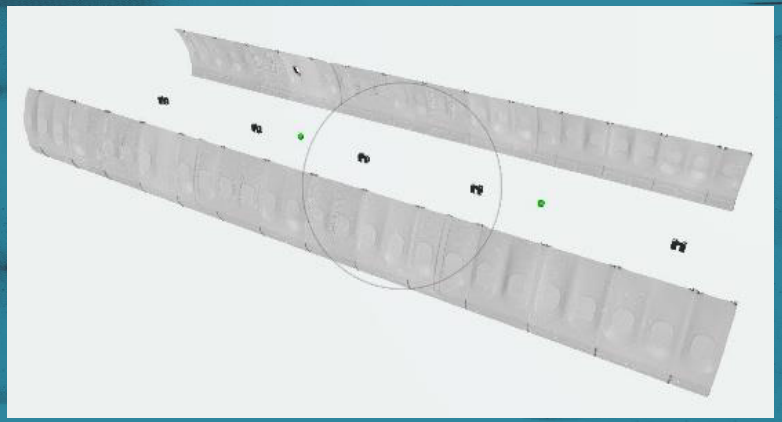
- After sidewalls are installed, scan of the whole cabin or only a section, alignment with 3d nativ data and compare

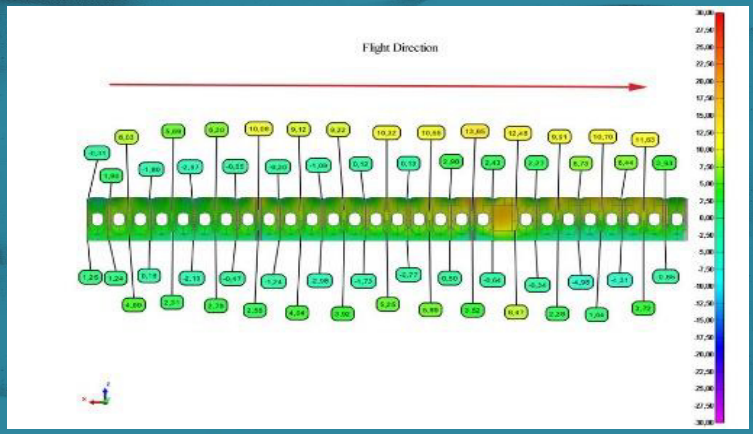
RESULT

- Project in test phase

OBJECTIVE / GOAL

- To reduce the rework time (seat deinstallation, sidewall panel adjustment)





COOLING FIXTURE DEVIATION

CUSTOMER/ PRODUCT

- MCM

INITIAL SITUATION

- Satelite mounting bracket for military viehcles is constantly not to dimensional specifications.

WAY OF WORKING / METHODOLOGY

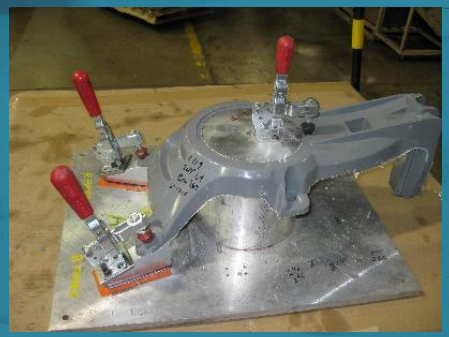
- Scanning of bracket multiple times to give deviational trend.
- Using customers clamping methodology to look in to dimension error.

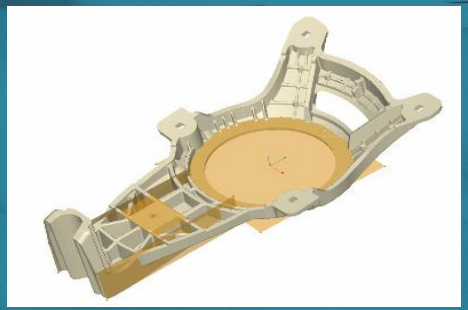
RESULT

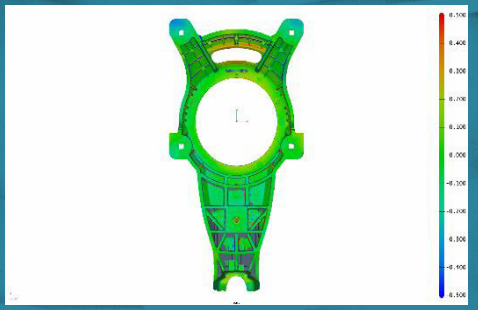
- Report given over through multiple scans and reports.
- Our recommendations reported to the client.

OBJECTIVE/ GOAL

- Better understanding about deviations on cooling fixture.
- Wayford forward on the modification of design of cooling fixture.
- Resulted in accurate stable and repeatable product.







MILITARY HELMET SCANNING

CUSTOMER/ PRODUCT

- Undisclosed

INITIAL SITUATION

- Modification of exsisting helmet to convert between targeting sights to Augmented Reality targeting sights

WAY OF WORKING / METHODOLOGY

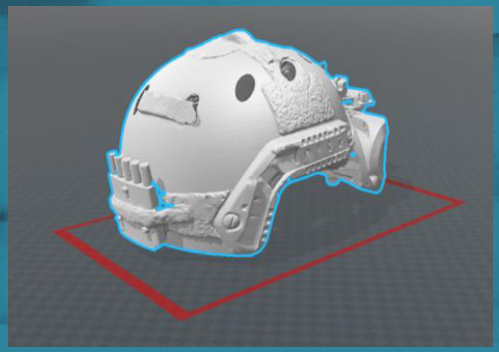
- Full scan of every part of helmet and current targeting system.
- Design of adapter to AR targeting system.

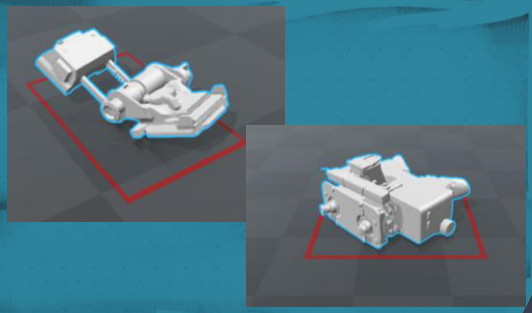
RESULT

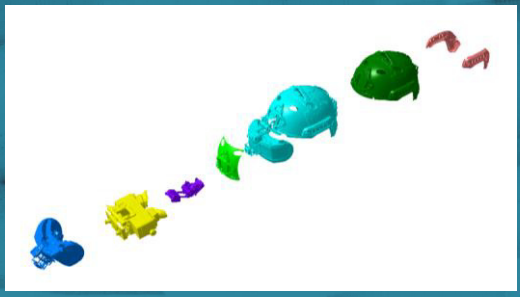
- Scans taken for reverse engineering.
- Break down of all components.

OBJECTIVE/ GOAL

- Data given back from scan for reverse engineering.
- Bracket adaptor design for AR.
- In use for training.







AIRBUS PIPE SCANNING

CUSTOMER/ PRODUCT

- Airbus

INITIAL SITUATION

- Pipes from the A320 needed scanning because no 3d date is avadible

WAY OF WORKING / METHODOLOGY

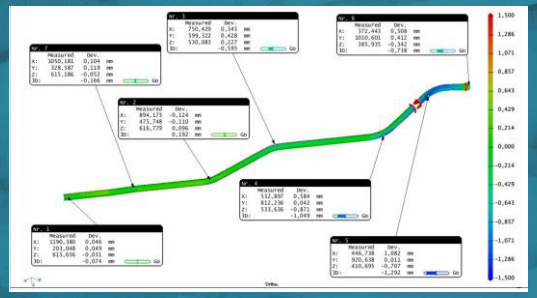
- Scan the pipe with High Res Arm Scanner
- Reverse engineer the features
- Recreate the pipe in 3d
- Make a deviation report to the nominal

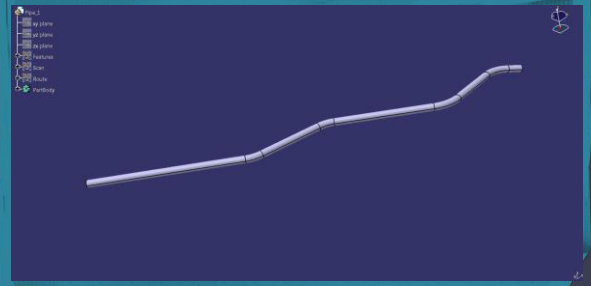
RESULT

- Catia Part created out of 3D Scan with deviation report to drawings

OBJECTIVE/ GOAL

- Create 3D Data from Parts where only Drawings exist





AIROUTLET PROTOTYPING

CUSTOMER/ PRODUCT

- Airbus H51

INITIAL SITUATION

- Airbus H51 needs prototypes for new Air Outlet with organic inner structure for air flow created with clay by hand becaus its faster than in 3d

WAY OF WORKING / METHODOLOGY

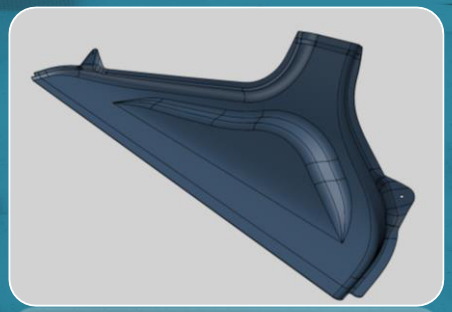
- The inner structure is build by hand with clay because its faster that to do it in 3D and easier and faster to change for imporovements
- After the design is finished the clay is scanned
- The scanned clay is then reverse engineered as a surface model
- The 3D model is then given over to the supplier who is creating the prototype without design loops

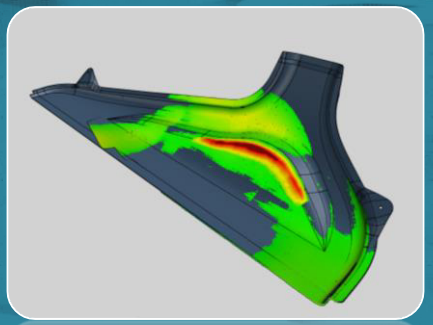
RESULT

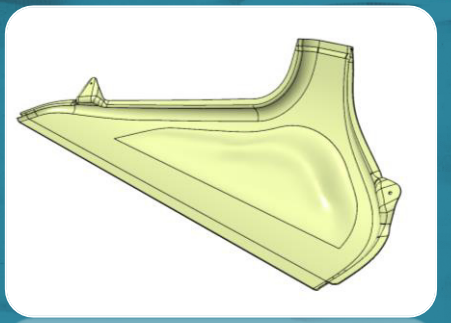
- Dramatically reduce the time and money spend for prototyping

OBJECTIVE/ GOAL

- Create faster Airoutlet Prototypes







AIROUTLET PROTOTYPING

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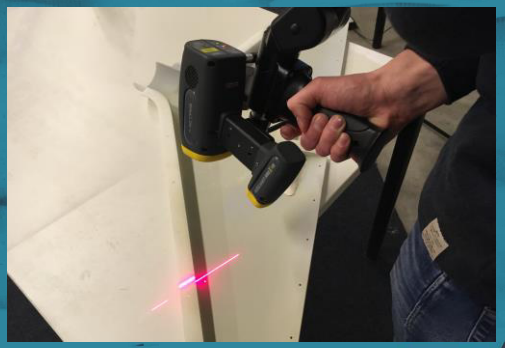
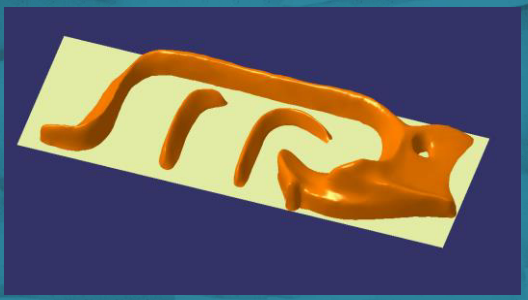




DOOR FITTING A350/A380/A320

CUSTOMER/ PRODUCT

- Airbus/ZAL

INITIAL SITUATION

- How to fit a door using as is scanned structure.

WAY OF WORKING / METHODOLOGY

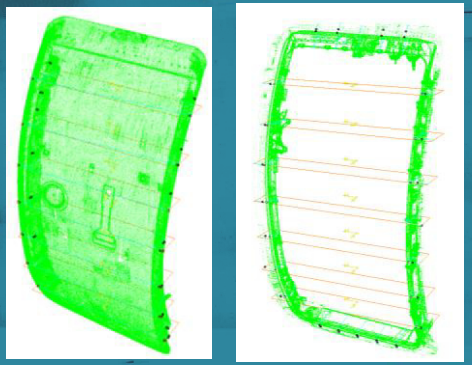
- Actual situation of manufactured Airframe and doors.
- Fitting using Betfit algorithms
- CLD designed mockup scenario to test different scanning methods and best fit processes.

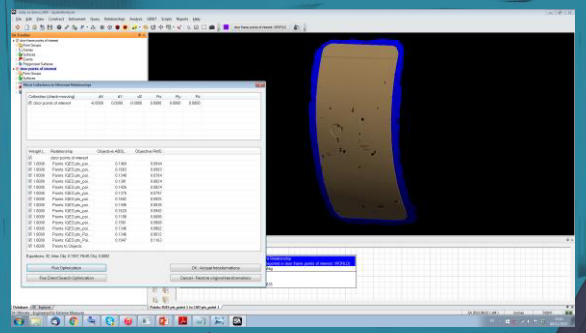
RESULT

- Faster and simpler installation of doors in to Airframe
- More accurate installation.
- Better understanding of deviation while installing doors

OBJECTIVE/ GOAL

- Better understanding of the door designs
- Aiding the mechanic instead of hindering through technologies





CONFIGURATION DOCUMENTATION

CUSTOMER/ PRODUCT

- Airbus

INITIAL SITUATION

- For the Transpose Module (Project Picard) was a configuration made in the CDC and it needed to be documented for later 3D Layout Design

WAY OF WORKING / METHODOLOGY

- In the A350 CDC Configuration Room was physically the Layout created for one transpose module and after that the whole setting was scanned

RESULT

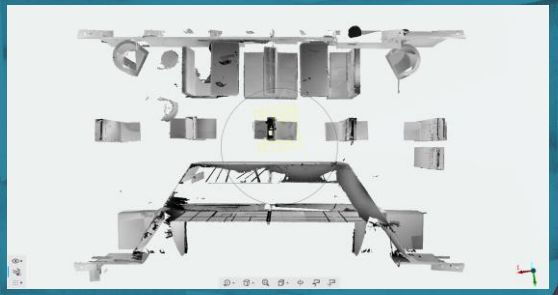
- A layout plan created our of the scan and alignement of the 3D data

OBJECTIVE/ GOAL

- Transfer the physically created model into 3D for further development

Reference

- A330 Transpose Module (Project Picard)



EVAC TEST

CUSTOMER/ PRODUCT

- Airbus

INITIAL SITUATION

- Documentation of the EVAC-Test Cabin Configuration

WAY OF WORKING / METHODOLOGY

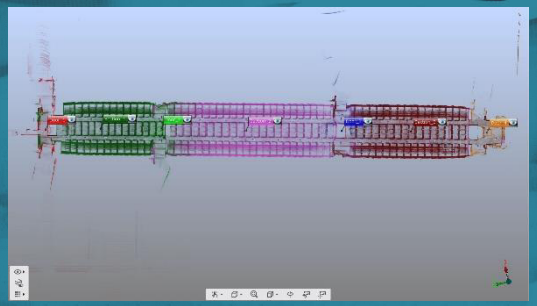
- After configuration of the cabin for the test, the whole setting was scanned for documentation

RESULT

- After Test each setting could be viewed virtually as an "Street View" with measuring capability

OBJECTIVE/ GOAL

- Reduce the effort for Documentation with excel sheets and pictures



Reference

- A350-100 EVAC Test

A320 INLINE LASER SCANNING

CUSTOMER/ PRODUCT

- Airbus/A320

INITIAL SITUATION

- Measuring of gap and flush along with eclipsing skin data for entire assembly process.

WAY OF WORKING / METHODOLOGY

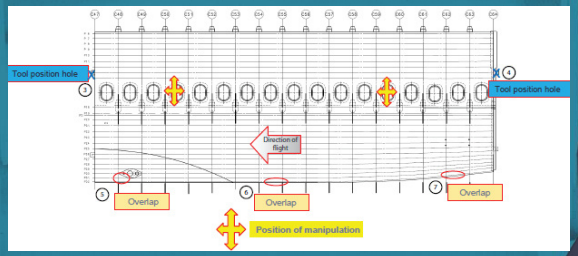
- Install inline lasers that do not hinder or obstruct the worker.
- Take measurements on sections so that tolerances and build up errors can be eliminated.

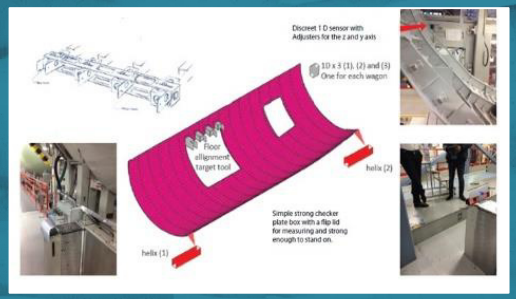
RESULT

- Install inline lasers that do not hinder or obstruct the worker.
- Take measurements on sections so that tolerances and build up errors can be eliminated.

OBJECTIVE/ GOAL

- Better understanding about deviations on build up.
- Used by blue collar to collect data.
- Excelerated understanding of product and to reduce rework on entire fuselage build up.





A320 SIDE SHELL

CUSTOMER/ PRODUCT

- Airbus/A320

INITIAL SITUATION

- Scan and compare features from an A320 side shell to see deviation from as built to cad nominal under pre instalation environments.

WAY OF WORKING / METHODOLOGY

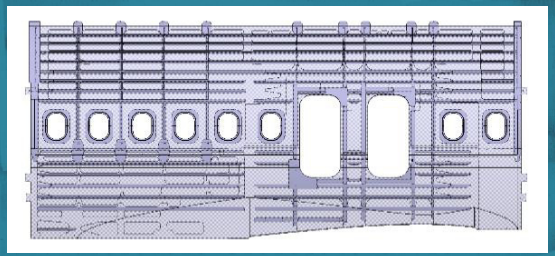
- Using robotic feature scanning robot, certain features.
- Macro program created to repeat process.

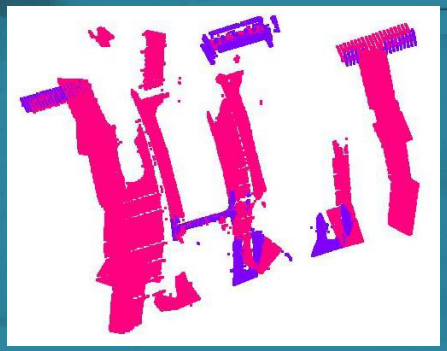
RESULT

- Features were scanned and used to compare the two situations of As built and as designed.
- Macro program created to work with the scanning robot.

OBJECTIVE/ GOAL

- Better understanding about deviations on Instalation of side shell.
- Repeatable program to use again and again for FAI
- Excelerated understanding of produc.





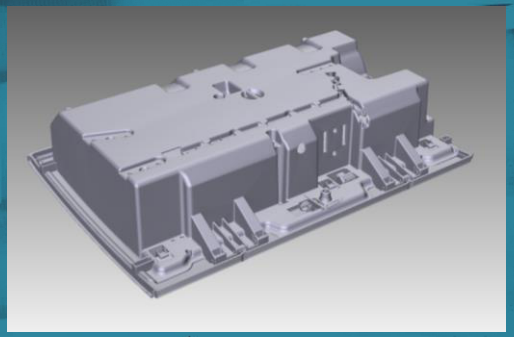
BE PSU DEVIATION INVESTIGATION

CUSTOMER/ PRODUCT

- BE Aerospace

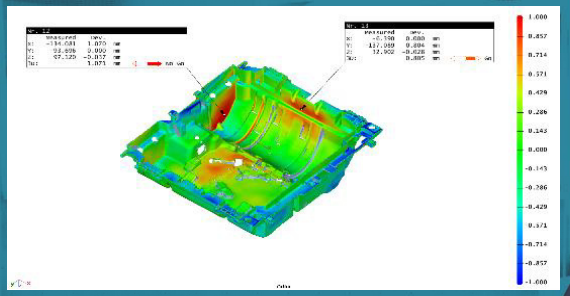
INITIAL SITUATION

- Sidewall panels clashes with the Backrest of the Seats



WAY OF WORKING / METHODOLOGY

- Scans taken of multiple parts in laboratory stable and repeatable conditions.
- After the scans are taken, they then fitted to the original CAD data to see deviation

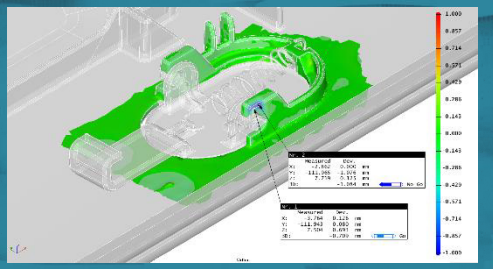


RESULT

- Better understanding of the produced part and its method for production, along with supplier limitations for manufacture.
- Better understanding of production methodologies for design to build

OBJECTIVE/ GOAL

- Modified designs produced to complement the suppliers production methodologies
- Better understanding on failures and sucesses for future reference
- Excelerated understanding of product for new designers.



3D SCAN

DER FOKUS

Die 3D Scan Technologie findet in immer mehr Bereichen Einzug. Wir haben uns jahrelang mit der Technologie als Entwickler auseinandergesetzt und sind seit ca. 2 Jahren auch als Dienstleister am Markt und haben und hier auf **zwei Bereiche** fokussiert:

- **3D Scan im Bauwesen**

www.centerlinedesign.de/de/video/3d-gebaeudescan
www.centerlinedesign.de/de/video/3d-revisionscan

- **3D Scan im industriellen Bereich**

www.centerlinedesign.de/de/video/3d-scan-qualitaetspruefung

THANK YOU

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