

DIC| Digital image correlation

Based on a digital image correlation technique and the stereoscopic principle of the setup with two cameras objects contour, displacement and strain is measured, **contactless** and **full field**.

Material- and stability tests, determination of material parameters, component tests, usage in tension test machines, validation of FEM calculations, exploration of cracks, measurements at airplane components (A380, static and dynamic), dynamic tests like **crash tests, pedestrian safety tests and airbag cover optimization**.



Features

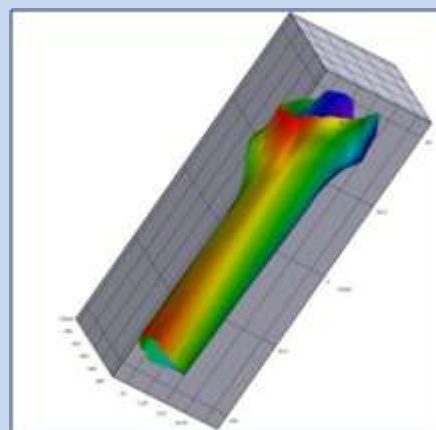
- ☑ 3d full field measurement of deformation , stain, displacement and geometry
- ☑ Large range of field of view (from 1mm² to > 100m²)
- ☑ Powerful export for CAD or further posprocessing
- ☑ Fast setup and short preparation time
- ☑ Measurement of static or dynamic events
- ☑ Comparison to FEA- Data
- ☑ High accuracy & flexible measurement

Applications

Material Testing

I. Tensile Test / Shear Test

Biomedical, Polymer, Composite, Metal

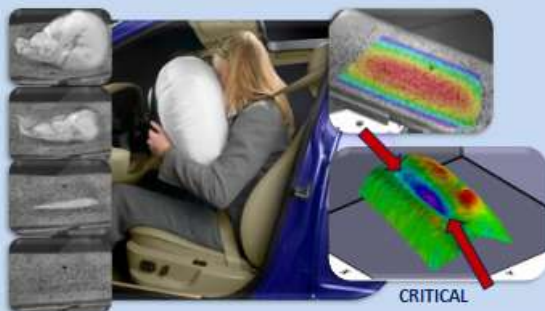


[The image shows the test setup and results for 3D image correlation measurements on a bone sample.]

Component Testing

Automotive

Passenger Airbag Test



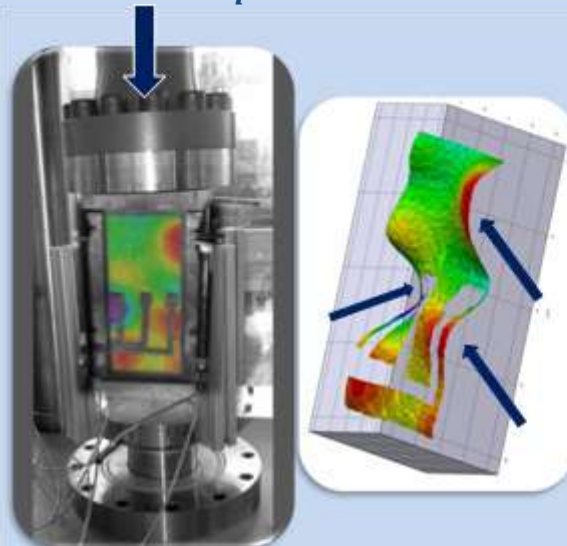
- Optimization of crack lines & airbag folding
- Two high-Speed cameras (5000 fps) used for capturing images at full resolution (1 MPixel)

| Result

Unexpected strain-compression behavior:
Crack line shows compression and not expected tension behavior (upper right image)

Aerospace

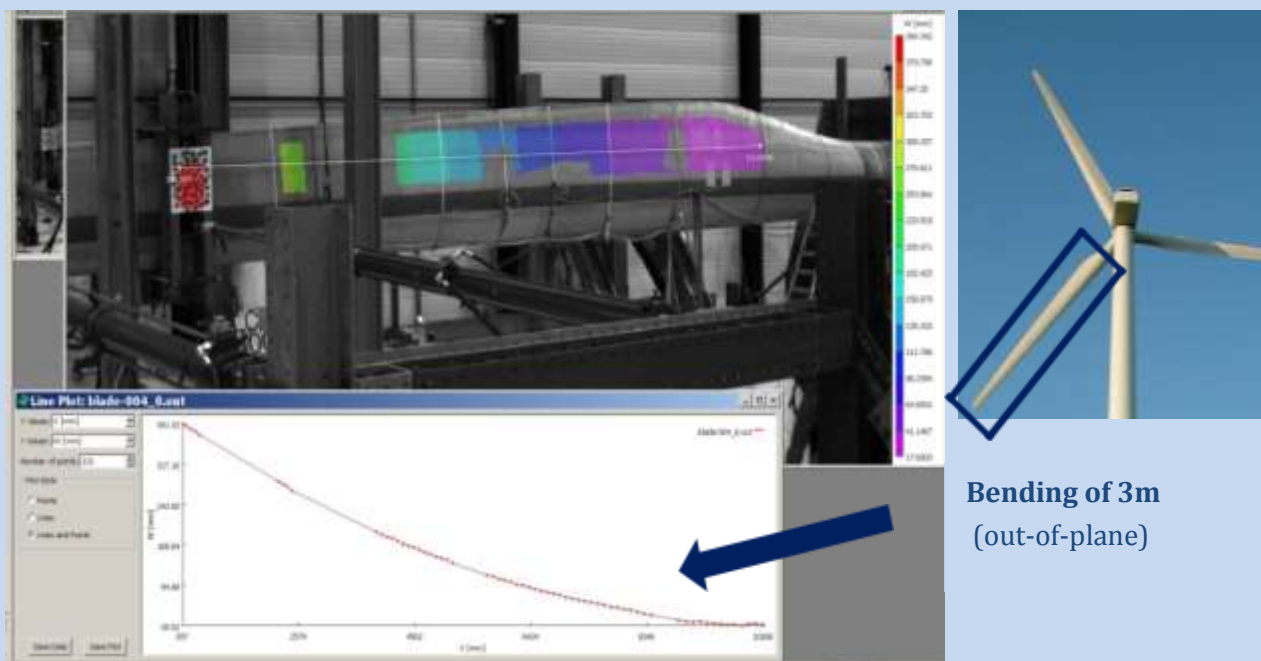
CFRP Panel compressions Test



Structure loaded with 600KN
Complex bending behavior

II. Bending Test

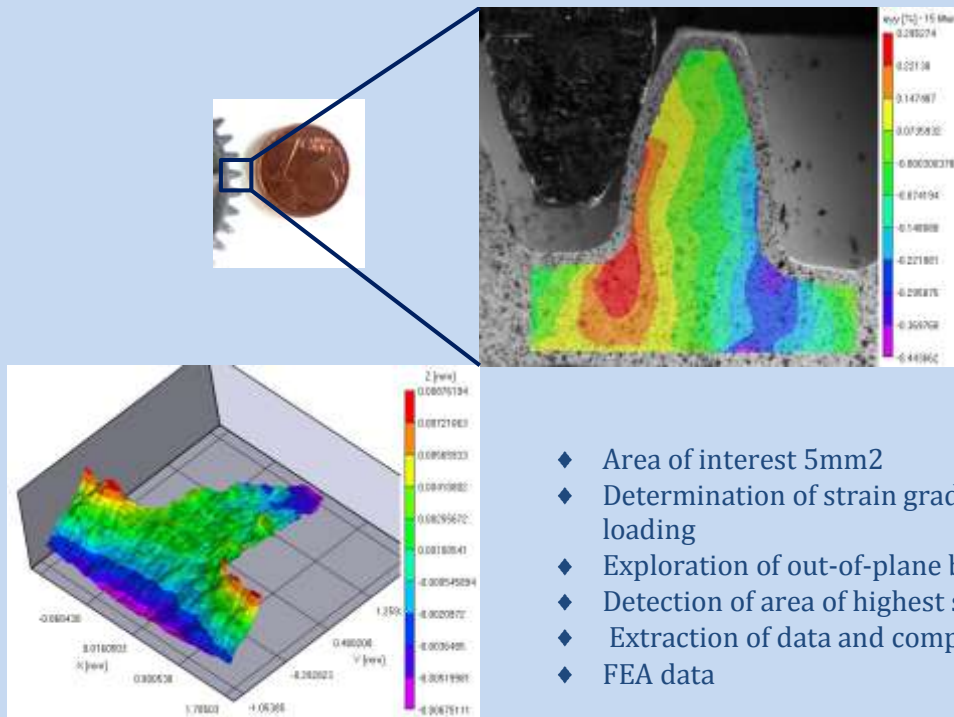
Sample wind engine blade



Bending of 3m
(out-of-plane)

[Blade length 20m; AOI width 10m
Natural structure of blade used for DIC]

Gear wheel measurement



|Out-of-plane deformation: 3D view

- ◆ Area of interest 5mm²
- ◆ Determination of strain gradients while loading
- ◆ Exploration of out-of-plane behavior
- ◆ Detection of area of highest strain
- ◆ Extraction of data and comparison to FEA data

Technical Specifications

Measurement field sizes:	1mm ² until >100m ²
Precision for displacement:	0,01 Pixel (1µm @ 1MPixel camera and 100mm AOI width)
Precision for strain:	200 µstrains (=0.02%)
Camera resolution:	0,3 MPixel until 16 MPixel
Frame rates:	10 fps until 750.000 fps (with high speed cameras)