

VEDDAC volume - our services

CWM offers deformation and failure analysis services:

➔ **DVC evaluation of CT image data of your loading experiments**

➔ **Realization of loading experiments (mechanical, thermal) with DVC evaluation of CT image data**
in cooperation with Fraunhofer ENAS Chemnitz and Bundesanstalt für Materialforschung und -prüfung (BAM)

Date: June 2020



CWM
Chemnitzer Werkstoffmechanik GmbH

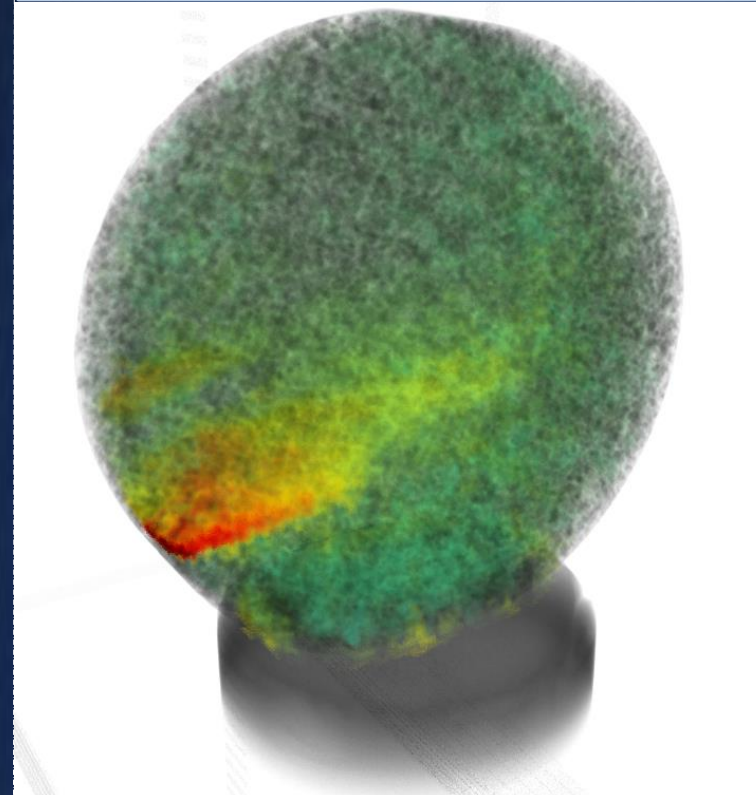
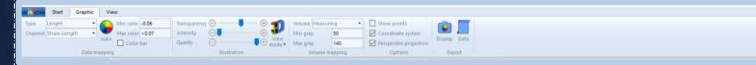
Technologie-Campus 1
09126 Chemnitz
Germany

T: +49 371 5347 960
F: +49 371 5347 961
E: info@cwm-chemnitz.de
URL: www.cwm-chemnitz.de



Chemnitzer
Werkstoffmechanik GmbH

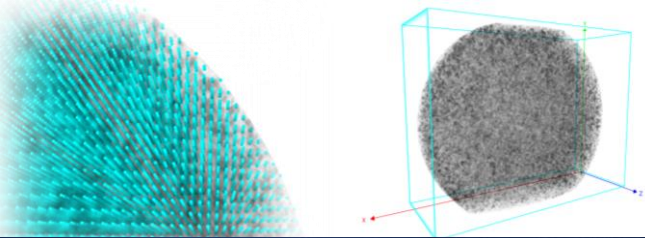
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VEDDAC volume



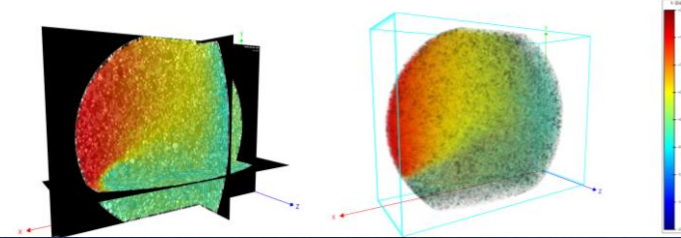
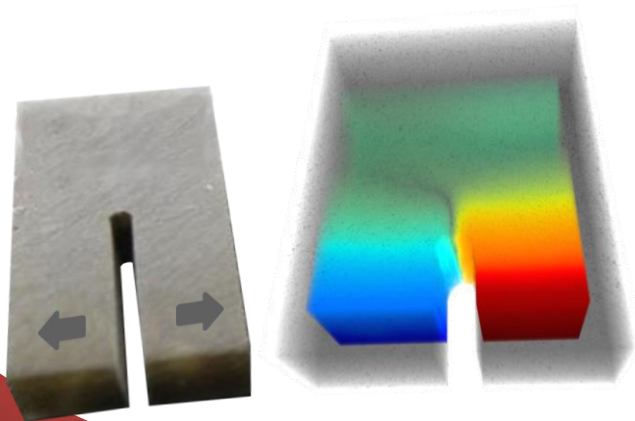
DVC software for the analysis of
motion | deformation | strain
inside the material



microDAC®volume - The method

microDAC®volume offers the possibility of investigating deformations and structural changes inside materials and components in a comprehensive and non-destructive manner.

The microDAC®volume method is based on 3D volume correlation (DVC - Digital Volume Correlation). The DVC is used to compare the load conditions of a volume from an in situ or ex situ experiment. The basis is the pattern recognition inside the material's own structures. The data can be generated by X-ray computed tomography (CT) or magnetic resonance tomography (MRT). Adapted to the specifics of the range of radiographic data occurring in practice, novel algorithms for calculation and visualization are used in order to enable a targeted evaluation of deformation mechanisms. Prerequisite for the application of the method in general are material contrasts and/or density differences in the object to be examined.

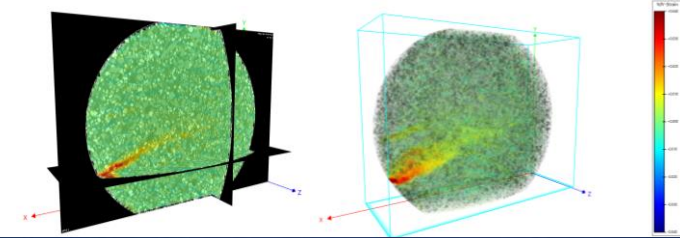
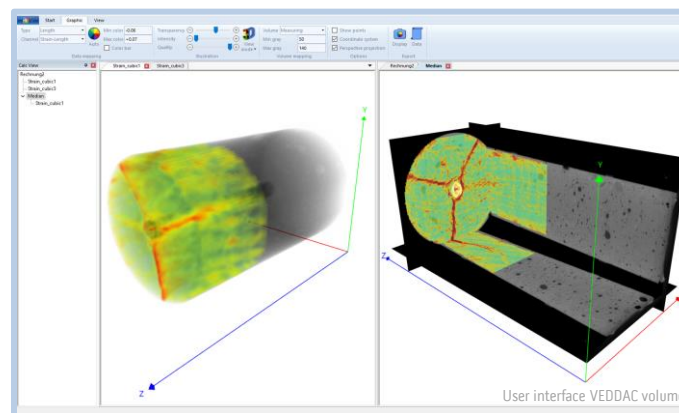


VEDDAC volume - The software

VEDDAC volume is the measurement software for the DVC method microDAC®volume. The device-independent software tool is universally applicable and intuitive to use.

With VEDDAC volume, two load conditions of a material volume can be compared with each other. The input format of the data for calculation with VEDDAC volume is a stack of successive tomographic sectional images.

In addition to our standard DVC, precise algorithms are available for noisy data and for the determination of smallest spatial displacements and strains. Various display formats, such as 3D cross-sectional images and semi-transparent 3D illustrations, offer various possibilities to detect and highlight these smallest changes in the material. VEDDAC volume is therefore an essential tool for early detection of cracks and material failure.



Technical specifications

Software:

- Processing of 2 load states
- Manufacturer-independent data format can be read in (CT data as image stack .bmp, pre-registered*)
- Visualization of the raw data 2D/ 3D
- Setting + visualization of measuring points
- Selection of various parameters for the calculation with DVC
- Performing the calculation, resolution of the calculated displacement up to 0.01 voxel
- Visualization of the results of the calculation 2D/ 3D
- Filtering of the calculation data as required
- Calculation of strains (local / global)
- Export results: Images 2D/ 3D, data numerical

(Minimum-) System requirements:

Personal computer with:

- Intel Core I7 Processor or equivalent
- RAM at least twice as large as both CT images together
- DirectX 11 featured high-performance graphics card with >4GB RAM (Nvidia/AMD)
- Operating system: Windows 10

Image sources of the application examples shown here:
 Concrete sample in the "double-punch-test" in-situ, Bundesanstalt für Materialforschung und -prüfung (BAM)
 Tablet Compressive load ex-situ, Fraunhofer Institute ENAS Chemnitz
 Fracture mechanical analysis of plastics in-situ, Fraunhofer Institute ENAS, Chemnitz