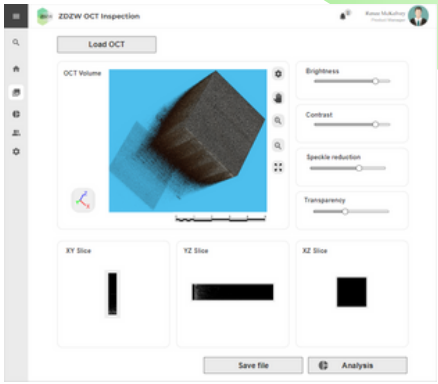
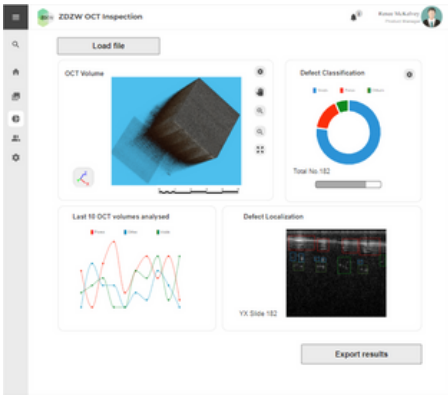
MIR-OCT

Real-time, non-contact, and non-destructive inspection of ceramic parts with ultra-high-resolution images, significantly reducing defect-related delays and energy waste

SOLUTION DESCRIPTION



MIR-OCT introduces an in-line, non-contact, and non-destructive **optical sub-surface inspection technology**. This innovative tool caters to companies involved in **additive ceramic manufacturing equipment** and those requiring **sub-surface inspection of coatings**.



In contrast to the utilization of traditional microscope-based post-manufacturing inspection methods, MIR-OCT **provides real-time fault detection**, leading to streamlined manufacturing processes and reduced waste.

By incorporating this technology, companies can notably **elevate the productivity of zero-defect components while concurrently minimizing energy consumption**.

MAIN BENEFITS

- Sample-dependent, requiring a combination of relatively low optical loss and scattering
- Fast, efficient, reliable and not dependent on an operator for defect detection and al algorithm for part quality inspection
- Optical fault detection and minimisation of delays in delivery of zero-defect products to the customer
- Easy optimization of manufacturing parameters and reducing energy/manufacturing waste
- Information can be forwarded to the operator in real time

The ZDZW project has received funding from the European Union's Horizon Europe programme under grant agreement No 101057404.

SUCCESS STORIES

MIR-OCT system successfully takes the OCT to mid-infrared wavelengths that are suitable for **inspection of highly scattering materials**, such as **ceramics and coatings**, while maintaining ultra-high depth resolution and real-time frame rates.

- The MIR-OCT scanner has already successfully provided **imaging through 20+ layers of ceramics** and demonstrated that it can detect defects at all stages of the printing process.

The OCT technology, particularly at visible and near-infrared wavelengths, has also achieved remarkable success in **medical fields** like ophthalmology and dermatology, with some relevant achievements:

- Efficacy of deep learning algorithms in OCT images for **eye disease screening**, e.g. for scanning the retina for glaucoma.
- Near-infrared OCT system, achieving groundbreaking resolution in **skin cancer imaging**, applying convolutional neural networks on to demonstrate automatic segregation of the epidermis.

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