



## APPLICATION REPORT

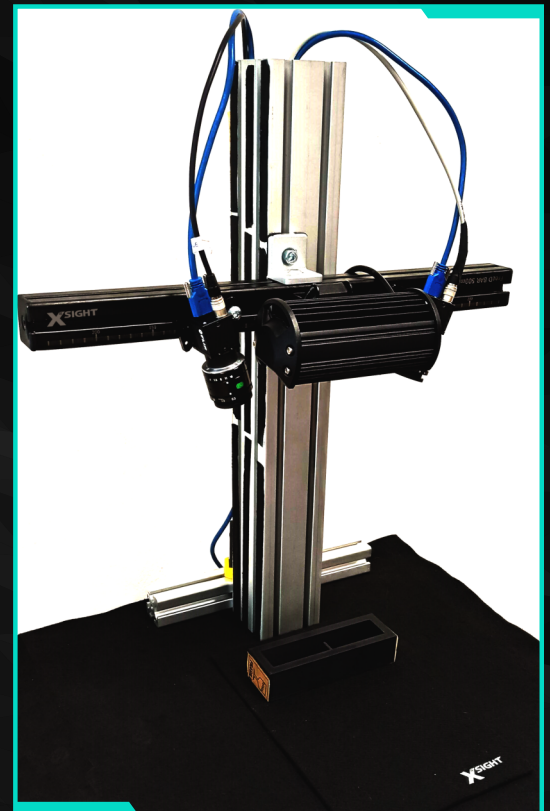
# 3D DIC MEASUREMENT: CONCRETE STIFFENING

## APPLICATION SPECIFICATION

The course of concrete stiffening over time was measured using the X-Sight 3D DIC optical measuring system.

Initially, the mold for the measured sample was prepared, and the X-Sight 3D system was placed in the correct position for measurement. A 3D calibration was performed using a calibration grid. Later, the concrete was mixed and poured into the mold. Immediately afterwards, a speckle pattern was applied to the concrete surface using a spray.

The measurement process was performed with Synchron, the external camera trigger developed by X-Sight. During the first 3 hours of the stiffening process, the cameras recorded one frame per minute. For the next 24 hours, the cameras recorded one frame per 5 minutes. After that, the cameras took one frame per hour for 10 days. Constant conditions were maintained over the course of the test.



X-Sight 3D DIC setup

### KEYWORDS

- Concrete
- X-Sight 3D DIC
- Synchron
- Long-duration test

### TEST SETUP

- X-Sight 3D-M12
- Alpha DIC SW modules: Axial Strain (A), DIC Area, Post Process (PP)
- Measuring tools:
  - Point probe
  - DIC Area probe
- Concrete specimen

### OUTPUT

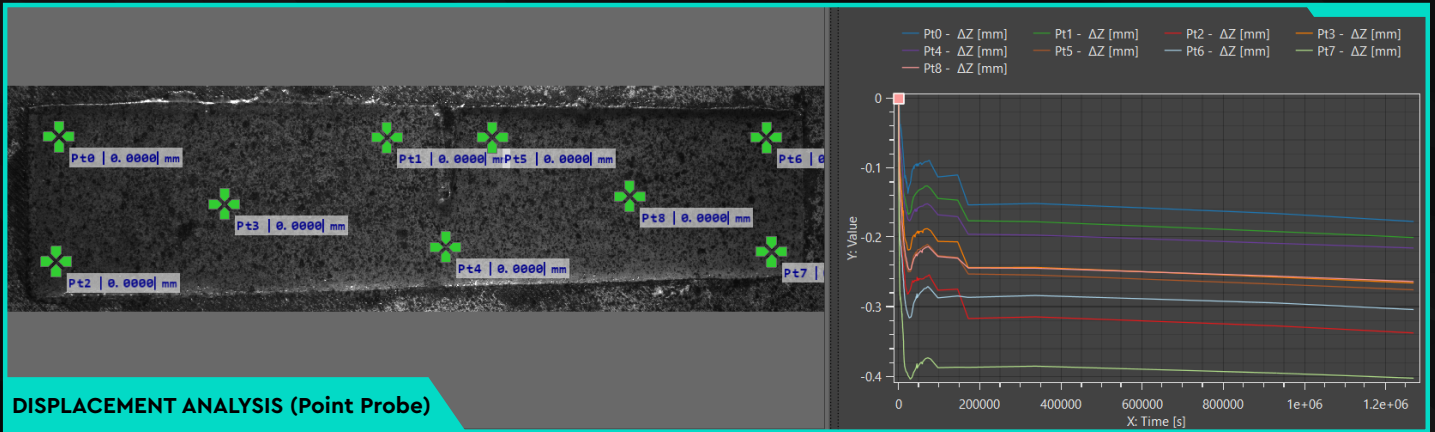
- Full-field strain analysis
- Potential crack areas
- Volumetric change

- Professional engineering support
- Modular software
- Real-time and post-process evaluation

- External triggering available
- Custom set-up for a wide range of applications
- Colorful strain visualization for real-time measurements

### WHY CHOOSE X-SIGHT?

# MEASUREMENT PROCESS AND TOOLS



## POINT PROBE

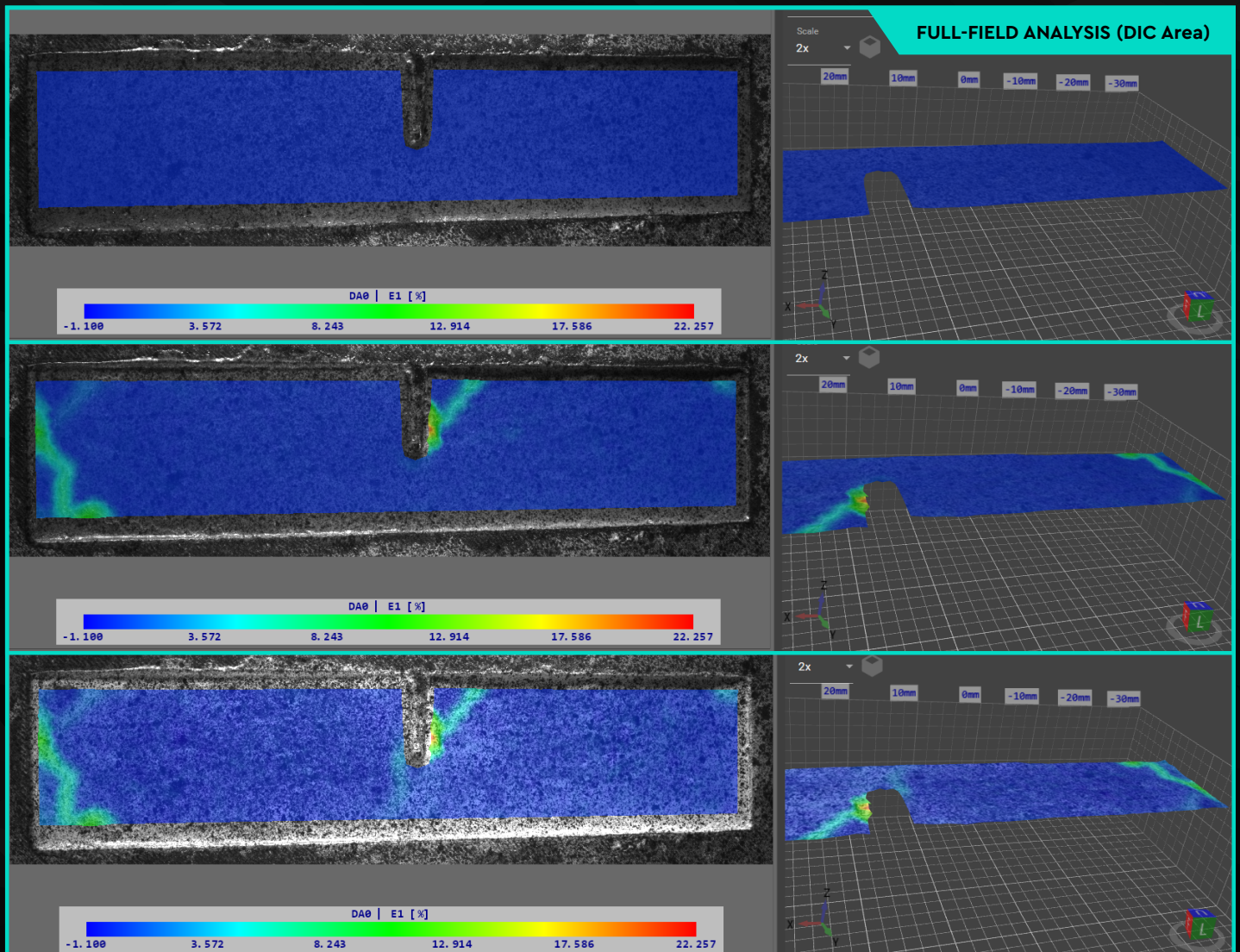


The Point probe tracks the movement of a single position on the specimen in the specified directions.

## DIC AREA



A full-field tool mapping displacement and strain distribution over a user-defined area. During the concrete solidification process shown below, its strain map corresponds to the changes in stiffness and color.



# MEASUREMENT EVALUATION

The measured values enable to evaluate the volumetric changes of the solidifying concrete in the form. Also, locations with a high probability of failure under load are identified and evaluated employing a strain distribution map.