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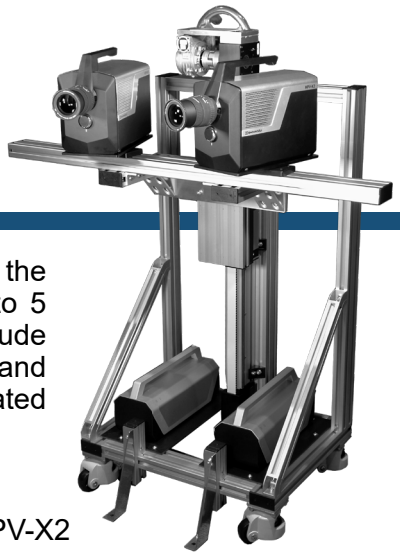
Measure with Confidence

VIC-3D with *iris*
Ultra High-Speed (UHS)



The VIC-3D Ultra High-Speed (UHS) digital image correlation system utilizes the fastest cameras on the market for DIC applications requiring frame rates up to 5 MHz. Examples of applications in which the UHS system has been deployed include explosive testing, high-velocity particle acceleration, ceramic fracture research, and much more. All systems are completely customized to your needs, fully integrated with our software, and installed by our engineers.

VIC-3D UHS Features

- Up to 5,000,000 frames per second at 400 x 250 pixels with the Shimadzu HPV-X2 Hypervision high-speed cameras (see image to the right)
- Stereo imaging allows for accurate 3D deformation and strain measurements under extremely dynamic conditions
- Easily view, set up, and acquire images using our proprietary VIC-Snap UHS software
- Seamlessly synchronize and record analog data with the included data acquisition system
- Illuminate your specimen with the supplied (and customized) ultra-high intensity LED lighting system
- Acquire and download test images while processing data from previous tests using the powerful VIC-3D control computer
- Feel confident that your system is supported by a team with over 200 years of combined DIC experience

Standard VIC-3D Features

- No mechanical interaction with the sample (no need to mount strain gauges, LVDTs, extensometers, etc.)
- Rigid body motion does not affect strain measurements
- Measure mechanical properties with ease
- Automatically identify strain concentrations, even in complex structures under complex loading conditions
- Process data at up to 500,000 data points/second
- Analyze your data using integrated intuitive inspection and extraction tools
- Quickly create complex animations and presentation material using VIC-3D's graphic engine *iris*
- Import FEA data for direct comparison or export point cloud data in universal formats

VIC-Snap Image Acquisition Software

When capturing images with the manufacturer's software for stereo DIC, it is often very tedious and difficult to a) ensure images are saved in the correct format, b) save images with the correct file naming structure for compatibility with the analysis software, c) record and synchronize external analog data with images/data, and d) acquire single pairs of synchronized images for stereo calibration. To overcome these problems, Correlated Solutions has adapted the acquisition software VIC-Snap to control and acquire data seamlessly from this highly sophisticated hardware. The exclusive VIC-Snap UHS software makes setup and data acquisition more efficient which saves time and money.

	VIC-3D Ultra High-Speed (UHS)
Camera Resolution	400 x 250 pixels
Frame Rate	Up to 5 MHz *
Memory	128 frames
In-Plane Resolution	1/50,000 • FOV
Out-of-Plane Resolution	1/25,000 • FOV
Strain Resolution	down to 10 με
Strain Range	from 0.005% to > 2,000%
Minimum Measurement Area	~ 50 mm
Analog Data Recording	10 MS/s / 4 inputs

* Achievable at reduced resolutions; export license required

Contact our Sales Team to explore the range of industry-leading digital image correlation systems from Correlated Solutions.

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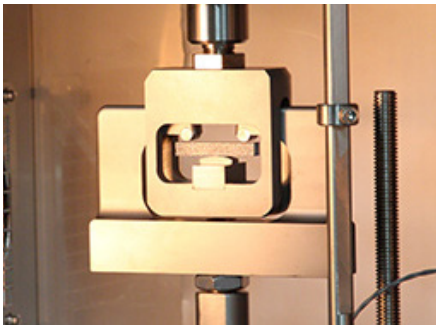
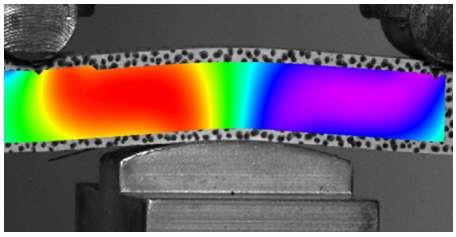
CASE STUDY - Deformation measurement on a glass/epoxy material undergoing extreme dynamic shear loading

Dr. Andrew Makeev and Research Engineer Brian Shonkwiler at the University of Texas Arlington Mechanical and Aerospace Engineering department operate a dynamic DIC testing laboratory. Together they conduct a variety of DIC tests ranging from quasi-static to extremely dynamic testing. In this particular example, UTA are utilizing the VIC-3D UHS system to measure dynamic properties of a glass/epoxy material. The purpose of this short beam shear test is to measure multiple material properties such as shear & axial modulus and shear strength.

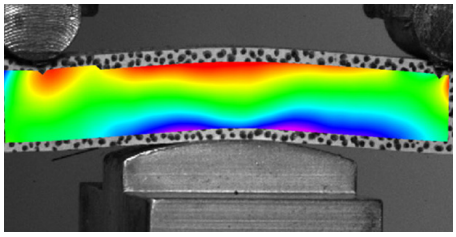
The turnkey VIC-3D UHS system from Correlated Solutions includes two Shimadzu HPV-X2 cameras which are conveniently controlled with Correlated Solutions' acquisition software VIC-Snap UHS. The images are acquired during the event, downloaded, and then post-processed with VIC-3D. The frame rate for this test was 666,667 FPS with a 200 nanosecond exposure. The specimen was speckled using a permanent marker, and an extremely bright stroboscope was utilized to illuminate the specimen. The impact velocity was 10 m/s, and the specimen reached approximately 3.5% shear strain at failure as shown in the images below.



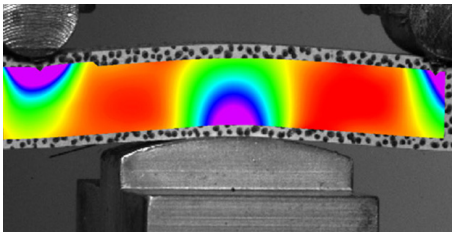
VIC-3D UHS camera setup



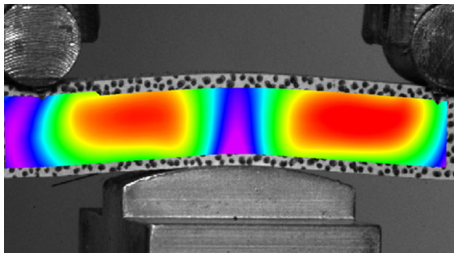
Peak shear strain before failure



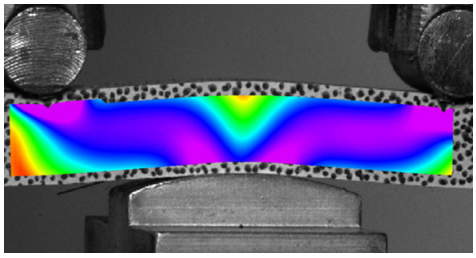
Peak axial strain before failure



Peak transverse strain before failure



Peak major strain before failure



Peak minor strain before failure

"The purpose of the impact test is to determine how the dynamic characteristics of the material properties differ from the static properties. The importance of using the VIC-3D system is the fact that there are steep strain gradients on the face of the specimen. We would never get the strain information we need using a strain gauge."

-Brian Shonkwiler, University of Texas Arlington

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