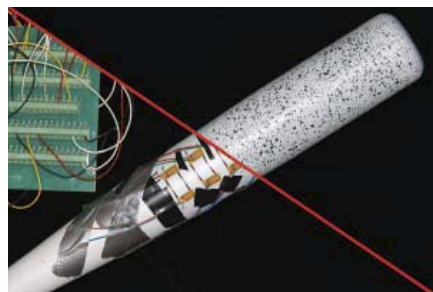


Dynamic Deformation Measurement

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High-Speed Capabilities

- Camera models available offering a wide range of speeds and resolutions
- High-Quality image sensors
- Up to 1,000,000 fps
- Sold as a complete turnkey system with training for quick start-up

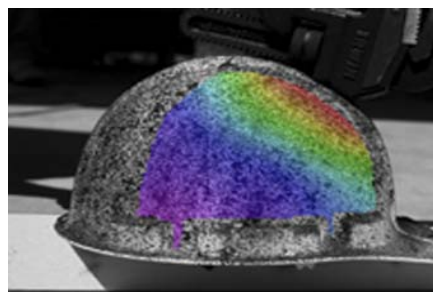
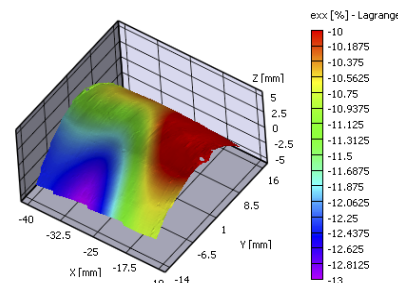


Non-Contact

- Eliminates strain gages, lacquers, gratings and cumbersome wiring
- No mechanical interaction with the sample
- No need for precise placement in order to get valid results
- No influence upon vibrating specimens
- Samples can be prepared in minutes and measured without undesirable influence from clips, gages, or chemical coatings

User-Friendly

- Safe, simple white-light illumination
- No optical isolation table needed for accurate measurements
- System can be recalibrated mid-experiment
- Automated data processing frees up valuable time
- Can cut and paste 3-D graphs into MS-Office applications
- System can be up and in use in as little as one hour



Full-Field Measurements

- Allows you to see deformations over an entire area
- Measurements are not limited to single points
- Helps you to easily identify critical points, even in complicated structures or under complex loading conditions
- Data can be extracted from previously unrecognized hot-spots without retesting

The Correlated Solutions VIC-3D measurement system can save you valuable time while improving the quality of your deformation or strain measurements. Specimen preparation is simple and quick, and your test specimen is not affected by the measurement process. It might sound too good to be true, but it has been field-proven by professionals like you. Give us a call to find out how you can increase lab throughput, while increasing data quality.

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Application Example

High-Speed Compression Test

Studying the behavior of metals during a high-speed dynamic compression event has always been challenging due to the complex test set up and fast data capture rates required. Currently, very little literature is available regarding deformation behavior at strain rates of 10 to 500s⁻¹. Utilizing high-speed cameras, the VIC-3D HS system can be used to quantify the surface displacements and strains in three dimensions over the entire field with great precision. Digital Image Correlation (DIC) has gained widespread popularity over recent years in such high-speed applications due to its high accuracy, flexibility and ease of use.

In this example, a 6mm diameter cylindrical specimen was compressed at a strain rate of 50s⁻¹. The VIC-3D HS system was used to capture the surface displacements and strains on the specimen during the event. Figure 1 shows the test setup with the high-speed cameras focused on the specimen. A random speckle pattern is applied to the specimen that allows the analysis software to easily track the deformation to sub-pixel accuracy. Although the high-speed cameras are capable of much higher capture rates, for this test they were set to an appropriate frame rate of 14,400fps to maximize spatial resolution while acquiring an adequate number of images during the event. The cameras were post-trigger at a resolution of 1024 x 400 pixels. After the event, the images are transferred to the computer's hard drive, and then post-processed using VIC-3D analysis software. Figure 2 shows a full-field contour plot of the transversal strain (E_{xx}) overlaying the raw image at t = 4.4ms. The compressive strain observed was found to be non-uniform.

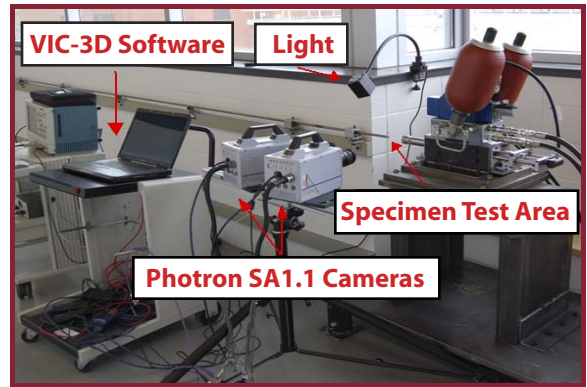


Figure 1. VIC-3D HS Test Setup

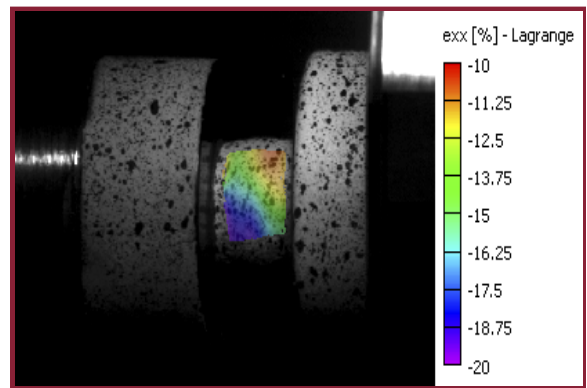


Figure 2. Contour image overlay of transverse strain at t = 4.4 ms

The content from Ohio State University is greatly acknowledged

Specifications

	VIC-3D SR	VIC-3D HR	VIC-3D XR	VIC-3D HS
Measurement Area	mm ² to m ²	mm ² to m ²	mm ² to m ²	mm ² to m ²
Strain Measurement Accuracy	up to 50µε	up to 50µε	up to 50µε	up to 50µε
Strain Measurement Range	0.005% to >2000%	0.005% to >2000%	0.005% to >2000%	0.005% to >2000%
Camera Resolution	1624x1224, 14-bit	2448x2048, 14-bit	4872x3248, 12-bit	1024x1024, 12-bit
Maximum Frame Rate	25 fps	15 fps	4 fps	up to 1,000,000 fps
Exposure Time	20µs-10s	20µs-10s	625µs-1s	1µs-16ms
Analog Data Recording	4 channel, 16-bit A/D	8 channel, 16-bit A/D	8 channel, 16-bit A/D	8 channel, 14-bit A/D
Automatic Calibration	yes	yes	yes	yes
Camera Disturbance Correction	yes	yes	yes	yes
Multi-system Stitching	yes	yes	yes	yes

*custom systems are available

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