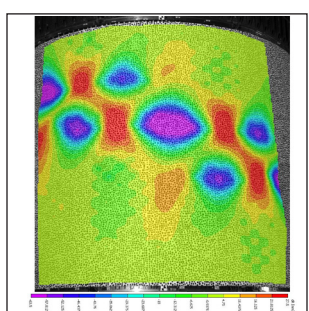
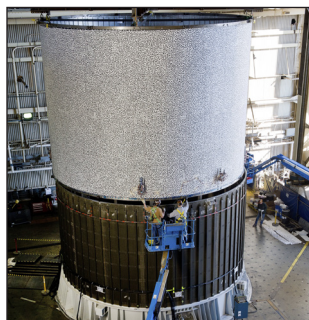
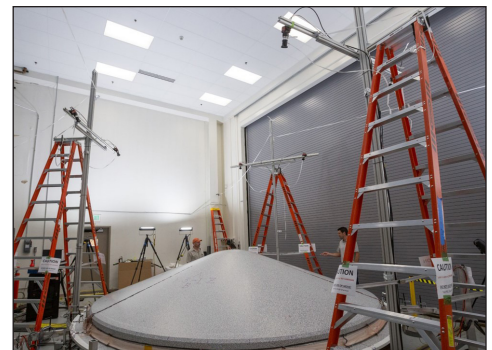
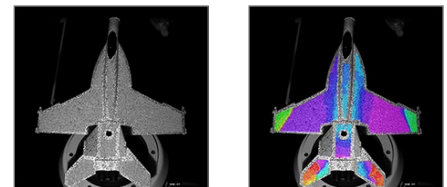


VIC-3D with *iris* for Aerospace Engineering

The VIC-3D digital image correlation (DIC) system from Correlated Solutions is the most powerful turnkey system for non-contact measurement of full-field surface shape, deformation, strain, vibration, and much more. With a range of new features including direct data comparison with finite element models (FEA) and data visualization with *iris*, the VIC-3D system is poised to change the way aerospace engineers around the world validate models and share their results. Contact us today to see how we can help you with your testing and research needs.

DIC Technology Advantages

- No mechanical interaction with the sample
- Eliminate the need for strain gauges, LVDTs, extensometers, etc.
- Rigid body motion can be easily removed
- Measure mechanical properties easily
- Measure dynamic and vibration behavior utilizing high-speed cameras or a stroboscope
- Up to 45 million data points possible per stereo system
- Automatically identify strain concentrations, even in complex structures under complex loading conditions
- Fast data processing: up to 1,000,000 data points/second and intuitive inspection and extraction tools
- Easily import and export data for FEA comparison/validation
- Fully-integrated camera control software with analog inputs



VIC-3D is the fastest, most accurate digital image correlation system on the market. Additional key features include:

- Python scripting for customized and repeatable analysis, including batch processing
- Hybrid calibration options for improving calibration via the use of speckle images
- Customizable calibration options for modeling radial, prismatic, and tangential distortions
- Unique calibration for underwater applications using Variable Ray Origin (VRO) algorithm
- Completely integrated and customized turnkey systems with training, system maintenance, and technical support

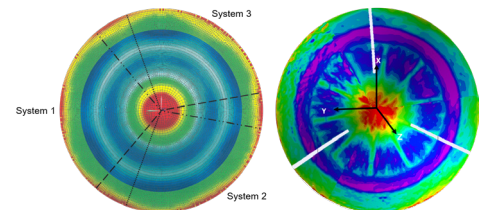
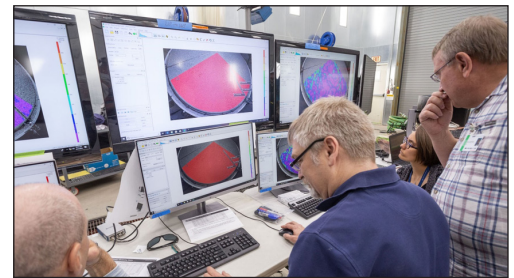
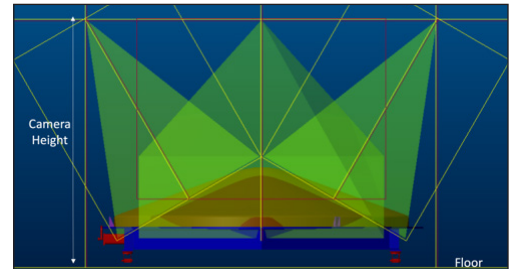
CASE STUDY - NASA Mars Rover Structural Damage Assessment

On July 30, 2020, the Mars 2020 Perseverance Rover was launched at Cape Canaveral. After seven months, it reached Mars on February 19, 2021. An especially important component to the project was the composite heat shield that protected the Rover as it entered the Martian atmosphere. In order to test the heat shield, the Atmospheric Flight and Entry Systems Branch at NASA Langley, led by Dr. Sotiris Kellas, deployed the Correlated Solutions VIC-3D digital image correlation system.

This was the first time a full-field photogrammetry technique was implemented on flight hardware at this scale to provide a better understanding of the heat shield response under load. This test used three VIC-3D 31 megapixel DIC systems to cover nearly the entire 14.5' diameter of the heat shield surface. Instead of the usual painted speckle pattern, Dr. Kellas' team applied the pattern on a self-adhesive film, so it could be removed after the test. The heat shield was subjected to simulated entry pressure and deflections were monitored to prove the effectiveness of the shield.

“Being able to see the entire heat shield surface was a huge advantage. For a given load step displacement or strain, contours could be compared visually against the analytical predictions. More importantly, following the test, post processing data were transferred to the Finite Element Model for a more precise test analysis correlation.”

-Dr. Sotiris Kellas, Atmospheric Flight and Entry Systems Branch at NASA Langley



	VIC-3D LS	VIC-3D QX	VIC-3D HS	VIC-3D UHS
Camera Resolution	2.3 MP - 45 MP	12.3 MP	Up to 4 MP	400 x 250 pixels
Frame Rate	400 Hz - 16 Hz	Up to 335 Hz	Up to 500 KHz *	Up to 5 MHz **
In-Plane Resolution	1/200,000 • FOV	1/200,000 • FOV	1/100,000 • FOV	1/50,000 • FOV
Out-of-Plane Resolution	1/100,000 • FOV	1/100,000 • FOV	1/50,000 • FOV	1/25,000 • FOV
Strain Resolution	down to 10 µε			
Strain Range	from 0.005% to > 2,000%			
Analog Data Recording	Up to 32 inputs	Up to 16 inputs	8 inputs	10 MS/s / 4 inputs
Full-field Real-Time Analysis	Yes, up to 10 Hz	Yes, up to 10 Hz	n/a	n/a
VIC-Gauge 3D Real-Time Analysis <small>(output of points, gauges, extensometers, etc.)</small>	Yes, up to 100 Hz Up to 4 real-time analog outputs	Yes, up to 100 Hz Up to 4 real-time analog outputs	n/a	n/a
FFT Module	Available	Available	Available	n/a

*Achievable at reduced resolutions, **Achievable at full resolution
All images courtesy of NASA.