

3D Digital Image Correlation: The Ultimate Biomechanics Tool For Displacements And Strains Testing

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Abstract

3D Digital Image Correlation (DIC) provides the ability to measure non-contact 3D coordinates, displacements and strains of materials and structures. This unique capability allows the equipment to be used for rapid full-field measurements from material characterization to full component testing, providing the equivalent of the results of over 10,000 contiguous strain gauges or displacement sensors. This technique is now recognized and certified (NIST, Boeing...) as equivalent to standard mechanical testing tools. 3D DIC is used across industries for improving the quality and the accuracy of the data collected to best understand mechanical behaviors of components or validate FEA models. The technology is now fully integrated with most load frame manufacturers such as Instron, MTS and Zwick. It provides a more flexible measurement platform with capabilities for any coupon size, very small to large strains with a single instrument as well as multi-axial data in every direction.

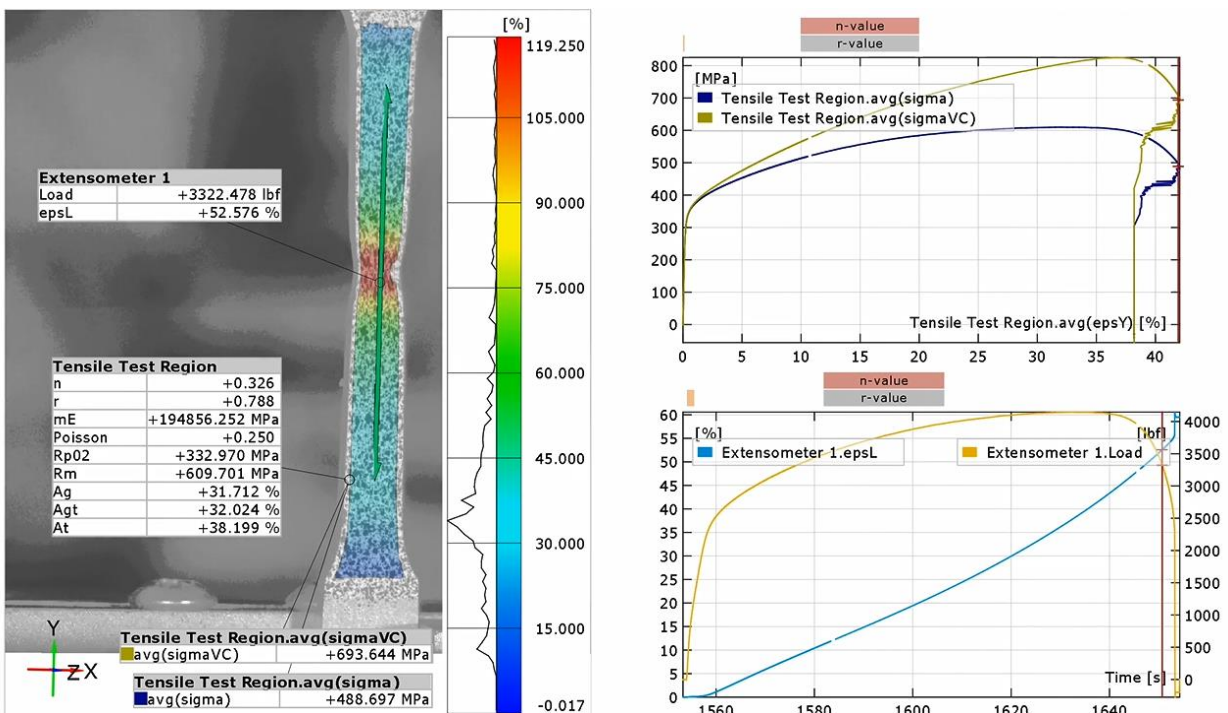


Figure 1: Tensile test of a metal dog-bone sample measured with 3D DIC, showing the strain field