



Optical Testing Application Guide

Future of Formability

ARAMIS Material Inspection

Autonomous Laser Etching

ARGUS Forming Analysis System

trillion

Save Labor, Costs, and Time.
Optimize Your Sheet Metal Forming

Industry 4.0 Formability



Advanced designs for complex parts

We provide customers with cutting-edge capabilities and the highest measurement accuracy to meet all design needs. Next-generation light-weighting parts require advanced formability methods and analysis. More advanced, non-linear modeling allows parts to be designed with the true complexity of their formation. More accurate designs result in precisely built dies and components, allowing for more exact formability measurements.

Trilion's Autonomous Laser Etch Robot (ALER) provides optimized patterning safely, without the use of hazardous chemicals. *The pattern produced is perfect every time.*

ARGUS formability measurements are the standard of the industry providing the most accurate data and flawless measurements directly compared with FEA.

Why Use:

Push the Limits

ARGUS and the ALER allow you to push the limits of formability reliably and efficiently.

Higher Quality

Industry 4.0 Formability automation supports higher quality lightweighting products.

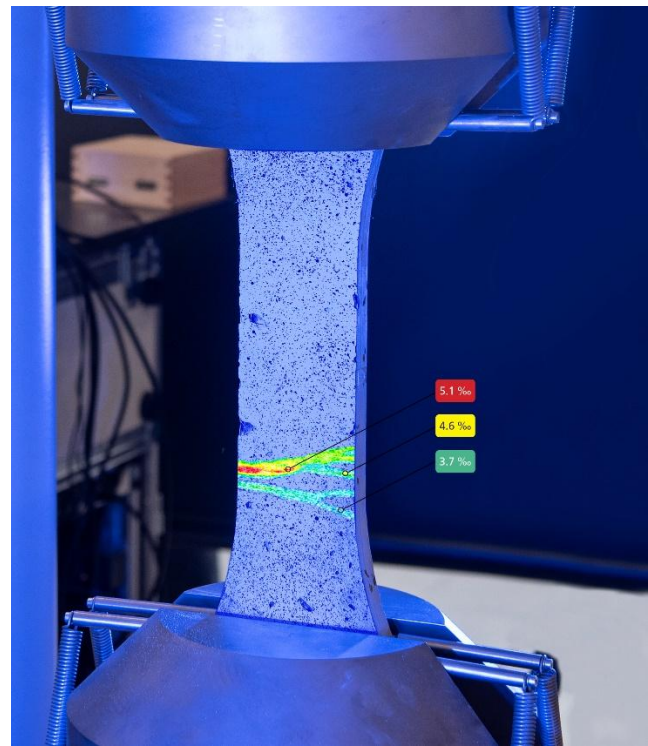
Save Time & Materials

Significantly reduce material waste and time loss from production errors.

ARAMIS Incoming Inspection

Real Forming Limit Curve (FLC)

ARAMIS 3D-DIC is the ideal tool for measuring material properties. Utilizing ARAMIS with an MTS tensile test allows the Real FLC to be measured directly on the incoming roll at blanking. The Real FLC measures the material formability properties, corrected for non-linear processing.



ARAMIS Kiosk

The ARAMIS Kiosk integrates directly with the MTS load frame, resulting in precise material property measurements. The Real FLC data is then used in the ARGUS System to make the most exact formability measurements compared to the real material properties.

With accurate material properties, FLC safety factors can be reduced, and the highest limit of formability is consistently achieved.

Test Machine Alignment

Measurement Validation is inherent with every ARAMIS measurement performed. Perfect alignment of fixturing is critical for getting good data. ARAMIS confirms proper 3D alignment and loading with every test, providing the most consistent material properties.

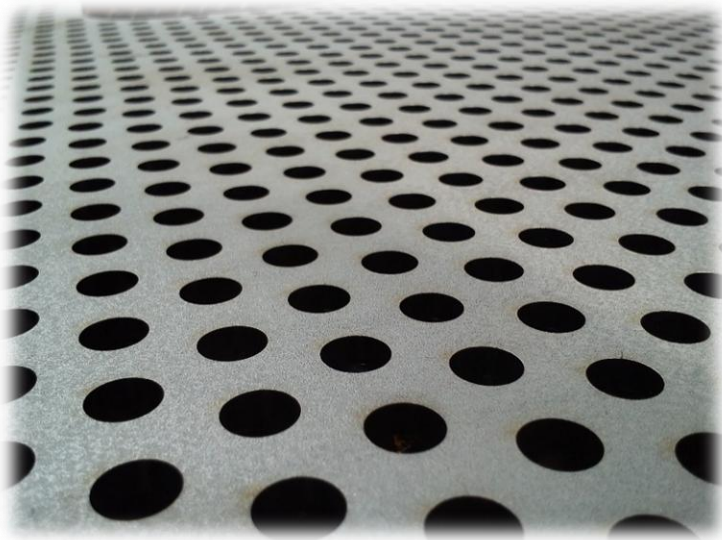
Laser Etching

Trillion Laser Etching Manual System (LEMS)

Trillion LEMS utilizes a precision industrial etching laser to accurately and easily etch an ARGUS measurement pattern on any material. This etching is performed safely, without the use of hazardous chemicals or noxious fumes.

Perfect Patterns

Laser etching creates a “perfect” pattern on parts with minimal operator effort. The inconsistent results of manual chemical etching will be a thing of the past, as laser etching creates superior patterns and results in higher-quality data.



Autonomous Laser Etching Gantry System (LEGS)

LEGS allows for fully automated laser etching. The system fits on any shop table and etches perfect patterns across sections or an entire sheet. It etches at the same speed of a typical laborer, but the resulting pattern is consistently perfect.

Trillion LEGS is *the best way* to reliably etch parts, allowing your team to perform other crucial production functions



Save Time and Money

Manual chemical etching produces inconsistent results, resulting in significant errors that waste materials and time. LEGS' superior patterns result in better built parts, saving time, money, and materials.

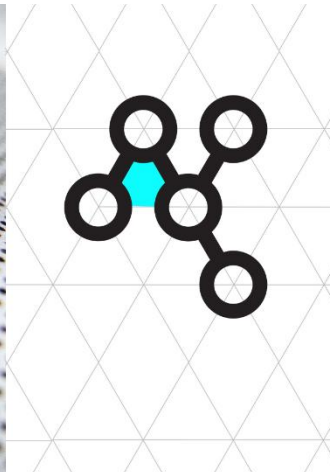
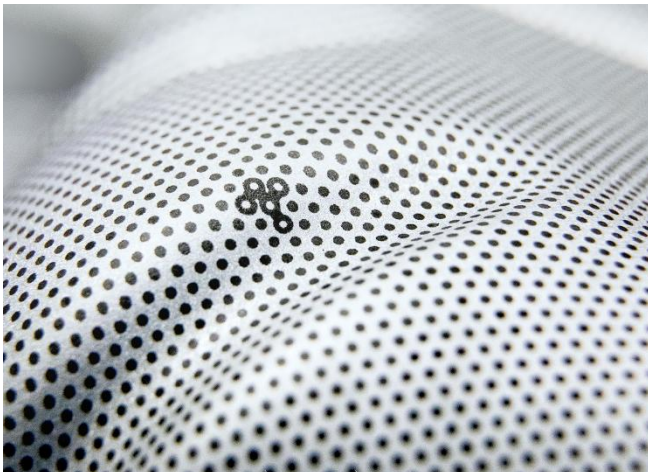
ARGUS

Optical Solution for Forming Analysis

ARGUS supports the optimization of sheet metal forming processes through precise and reliable measurements of surface strains on components. Measurements are performed accurately and rapidly for fast-tooling problem analysis and complete formability documentation.



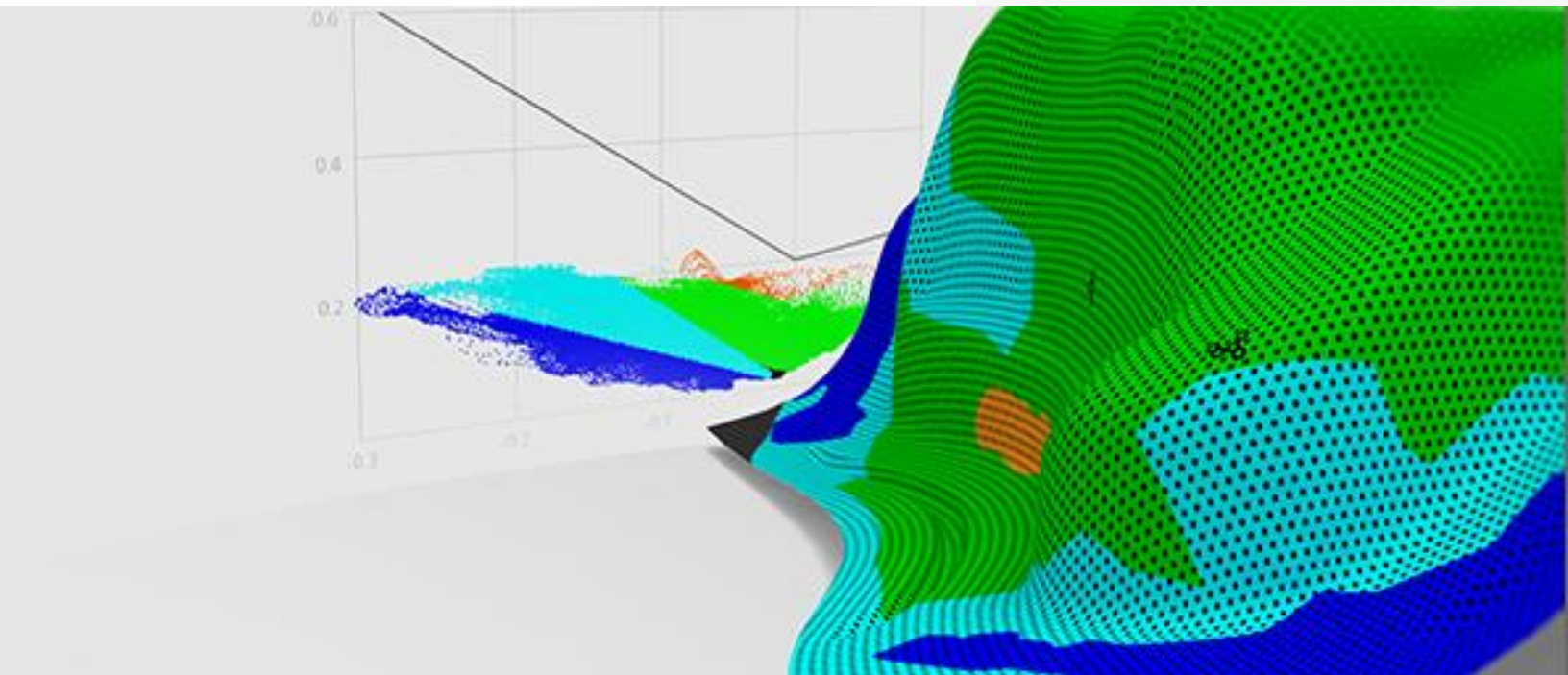
ARGUS provides a complete part formability analysis on the Real FLC. Strains and thickness reduction are compared to the FEA computer model, and the springback is compared to CAD.



The ideal tool for product development.

- ✓ Fast evaluation of forming processes
- ✓ Simple validation of simulations
- ✓ Mobile solution for components of any size

Benefits & ROI



Industry 4.0 Formability Packages

Linking manufacturing, formability, and engineering into a complete manufacturing feedback program results in ultra-high-quality products every single time.

Cost savings include more efficient operation and higher quality parts, drastically reducing warranty issues and increasing customer satisfaction



Achieve

Better Formability

Better Operations

Better Engineering

All-in-One Solution

For over 25 years, Trilion Quality Systems has been an industry leader in Optical Metrology Systems, developing and supporting unique applications throughout North America. Optical metrology brings long-awaited advanced industry 4.0 capabilities to the manufacturing.

Trilion Engineering Services is the perfect solution for companies with complicated applications and data requirements. We provide measurement method development and precision measurements. Our experienced level 3 engineers and precision optical measurement systems get professional results every time.

A manufacturing revolution, reducing costs and improving quality!

ARAMIS Optical Strain is the tool of choice for industry leaders.



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