2019 Engineered Residual Stress Implementation (ERSI) Workshop 2019

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Predict. Test. Perform.

analytical processes / engineered solutions

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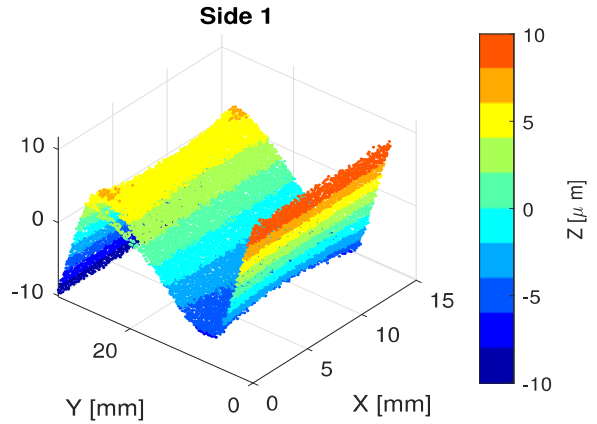
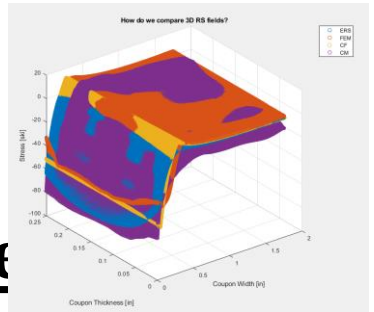
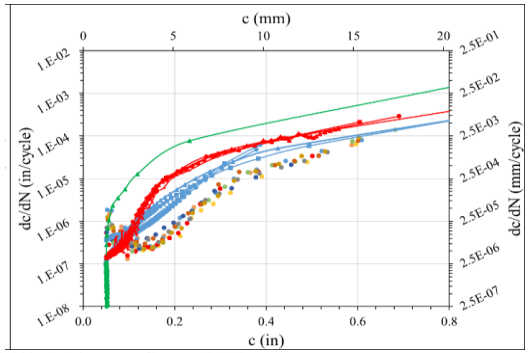
Announcements

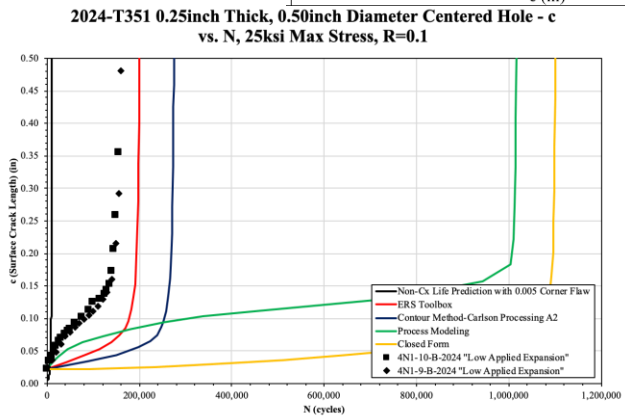
- Welcome to the 4th Annual ERSI Workshop
- Agenda is Flexible but Should Follow the one that was Printed/Provided
- Wi-Fi Information Provided on the Board
- Please Provide Presentations to Organizers (Carlson, Pilarczyk, Andrew)
- Lunch will be Provided both Days – Donations are welcome this year
- **Presentation are to Encourage Discussion – Please Ask Questions**

- **THANK YOU FOR COMING AND ENJOY!**









ERSI

Overview of Working Group Structure

Total Individuals within the Working Group - 78

- Countries Involved - 4
- DoD Organizations - 3 + FAA
- National Laboratory - 2
- Universities - 8
- OEMs - 4
- Industry Partners - 18
- Weapon Systems - 13

ERSI Executive Committee
Dr. Dale Ball (Lockheed Martin)
Dr. TJ Spradlin (USAF AFRL)

Mr. Dallen Andrew (Hill Engineering)
Dr. Scott Carlson (Lockheed Martin)
Mr. Robert Pilarczyk (Hill Engineering)

Integrator Committee

Technical Advisors
Mr. Chuck Babish (USAF ASIP)
Dr. Michael Gorelik (FAA)

Validation Testing
Mr. Jacob Warner
(USAF A-10 ASIP)

Fatigue Crack Growth Analysis Methods
Mr. Robert Pilarczyk
(Hill Engineering)

Residual Stress Process Simulation
Mr. Keith Hitchman
(FTI)

Data Management & Quality Assurance
Mr. Kaylon Anderson
(USAF A-10 ASIP)

Non-Destructive Inspection (NDI)
Mr. John Brausch
(USAF AFRL)

Residual Stress Measurement
Dr. Mike Hill
(Hill Engineering)

Risk Analysis & Uncertainty Quantification
Ms. Laura Hunt
Mr. Lucky Smith
(SwRI)

Purpose of the ERSI Workshop

1. To identify and **lay out a road map for the implementation of engineered deep residual stress** which can be used in the calculation of initial and recurring inspection intervals for fatigue and fracture critical aerospace components.
2. To **highlight gaps in the stat-of-the-art** and define how those gaps will be filled.
3. Then to define the most **effective way to document requirements and guidelines** for fleet-wide implementation.

ERSI

Vision of ERSI Working Group - 2016

Within 3-7 years have developed a framework for fleet-wide implementation of a more holistic, physics-based approach for taking analytical advantage of the deep residual stresses field, induced through the Cold Expansion process, into the calculations of initial and recurring inaspection intervals for fatigue and fracture critical aerospace components. Then move from there to other deep residual stress inducing processes, like Laser Shock Peening , and Low Plasticity Burnishing.

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