ASM International

**Residual Stress Technical Committee (ASM-RSTC)**

**Mike Hill – Committee Chair (Oct 1, 2021 – Sep 30, 2022), mrhill@ucdavis.edu**

**James Pineault – Vice Chair, xrdlab@proto.com**

**Beth Snipes – Secretary, Beth.Snipes@tec-materialstesting.com**

**Notes for ASM-RSTC Meeting Feb 23, 2022**

Attendees: Screenshot attached at bottom of minutes

TODAY:

Brief subcommittee reports

Technical Presentation

Chris D’Elia, UC Davis, Contour Method Reproducibility 11:40am PDT

Action items

Adjourn

Action items for members:

1. Send updated roster information to Beth Snipes (Beth.Snipes@tec-materialstesting.com)
   1. Email to follow
   2. Fill in a google form
2. Consider advertising the committee when presenting at professional meetings (small or large)  
   **Action for Exec**: develop a 1-slide advert for ASM-RSTC to be used by committee members  
   James will lead, Beth and Mike will help
3. Report RS-related society/organization activities to Mike Hill ([mrhill@ucdavis.edu](mailto:mrhill@ucdavis.edu)). RSTC will build a list of other professional organizations we link to (such as specific committees/codes/documents organized under ASTM, ASME, ISO, SAE, ICRS, ECRS, ICSP, etc.)
4. Report University RS activities to Joe Rasche via email ([joe.rasche@ansys.com](mailto:joe.rasche@ansys.com))
5. Recruit new members, especially developing engineers
   1. New today: Vijay Vasudevan (U North Texas)
   2. See RSTC Charter on ASM Connect (<https://connect.asminternational.org/communities/community-home?CommunityKey=d4811acc-211c-4e4d-b471-6a5a3645a93d> )
6. Suggest presentation topics for future meetings
   1. Student presenters especially welcome; contact James Pineault ([xrdlab@protoxrd.com](mailto:xrdlab@protoxrd.com))

Summary items

**Notes captured during meeting**

**Standing Agenda for Residual Stress Committee:**

1. Subcommittee reports
   1. Industry Standards (Dale Ball, Chair, dale.l.ball@lmco.com)

AMS RS Standard (Dale Ball): TBD

NEED another subcommittee meeting in late Feb or early March?

ERSI Update relates to USAF SB, link to be provided.

AMS RS Standard (Dale Ball): TBD

Something new, as of 2019: ISO-21432: Non-destructive testing — Standard test method for determining residual stresses by neutron diffraction

* 1. Residual Stress Handbook (Dave Furrer, Chair)

Subcommittee meeting held Feb 9

Reviewing Table of Contents, considering how different Divisions articulate

Next step would be to recruit authors

Will get TOC out for review by RSTC as a whole

* 1. Newsletter (Beth Snipes and Ben Wang, co-Chairs)

Logo Contest; Updated by ASM

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Send newsletter items to Ben Wang, [wang.ben@cummins.com](mailto:wang.ben@cummins.com)

Next newsletter to focus on Education subcommittee; also logo. Expect release April 1.

New item for newsletter: “Members in the News”. Please contribute.

* 1. Education and Chapter Outreach (Jeff Bunn, Chair)

Members: Bunn, Hill, Ben Salah, Snipes, Sicotte, Styger, Furrer,

Any new members?

Report from Andrew Payzant

AeroMat Workshop has been cancelled (only 3 registrants)

Workshop outline:

<https://www.asminternational.org/documents/44016883/0/Residual+Stress+Course+-+Bunn.pdf/ac444c7f-aa2f-7b0b-5dea-6f35d307472f>

NOTE for future: Workshop needs to be advertised to fill seats

Note: AeroMat still has RS session planned

Something at SEM (June 2022)?

Note for Jeff Bunn: Adrian can help organize

* 1. Professional Meetings. Conferences, Symposia (Lesley Frame, Chair)

Action for Committee: need a 1-slide advert for ASM-RSTC (plus link to RSTC Newsletters)

Volunteer?

See separate summary document

Meetings list needs to be updated, please

Aeromat: <https://asm.confex.com/asm/aero22/webprogram/Session9983.html>

ICRS proposal for USA meeting in 2025

Contact Andrew Payzant [payzanta@ornl.gov](mailto:payzanta@ornl.gov) or Mike Prime [prime@lanl.gov](mailto:prime@lanl.gov)

ICRS 2022 in Nancy, France

IMAT paper deadline extended

* 1. University Outreach (**TBD, Chair**)

Call from Joe Rasche on what academic labs are active in RS work

1. New business (topics and/or activities)

Neutron Diffraction Standard ISO 21432 discussed

1. Technical topic

Chris D’Elia, UC Davis, Contour Method Reproducibility 11:40am PDT

Chris is a Ph.D candidate at UC Davis and gave an excellent presentation. There was a discussion on possible contour method standard.

Abstract below. Slides attached to minutes.

**Interlaboratory Reproducibility of Contour Method Data in a High Strength Aluminum Alloy**

C.R. D’Elia1\*, P. Carlone2, J. W. Dyer3, J.B. Lévesque4, J. Araújo de Oliveira5, M.B. Prime3, M.J. Roy6, T.J. Spradlin7, R. Stilwell8, F. Tucci2, A.N. Vasileiou6, B.T. Watanable9, M.R. Hill1

1University of California, Davis, CA 95616

2University of Salerno, Fisciano (SA) Italy

3Los Alamos National Laboratory, Los Alamos, NM 87545

4Hydro-Québec Research Institute, Varennes (Québec), Canada, J3X 1S1

5StressMap – The Open University, Milton Keynes – MK7 6AA – UK

6University of Manchester, Manchester, UK M1 3BU

7United States Air Force, Air Force Research Laboratory, Wright-Patterson, AFB, OH 45433

8Boeing Co, Seattle, WA 98108

9Hill Engineering, LLC, Rancho Cordova, CA 95670

Submitted February 2022 to Experimental Mechanics for Special Issue on   
Advanced in Residual Stress Technology in Honor of Drew Nelson

**Abstract**

**Background**: The contour method for residual stress measurement has seen significant development, but an experimental reproducibility study has not been published. **Objective**: A double-blind reproducibly study is reported, having scope beginning with EDM cutting and ending with residual stress calculation. **Methods**: A reinforced I-beam sample geometry is identified for its unique residual stress profile when extracted from residual stress bearing quenched aluminum bar (7050-T74). Contour measurements are prescribed on a midplane of symmetry with dimensions 24 mm by 50 mm. Fourteen identically prepared samples are fabricated from a single long bar with well characterized and uniform residual stress. Five samples throughout the bar are identified for planning measurements to validate sample uniformity and overall suitability of the residual stress field. The planning measurements employ a range of techniques: contour method, neutron diffraction, and hole-drilling. Eight samples are distributed to an international group of participants to execute their standard measurement practice. A double-blind process is followed to provide anonymity. **Results**: Results are provided by eight participants: six being self-similar and two being quite different, the latter set aside as outliers. An average residual stress field is established from non-outlying results and the spatial distribution of reproducibility standard deviation is determined. The average stress field ranges from -60 to 70 MPa and the reproducibility standard deviation averages 8.1 MPa on the measurement plane. The average reproducibility standard deviation is about 3x larger for points within 1 mm of plane boundaries (17.6 MPa) than for the remaining points (6.1 MPa). **Conclusions**: Reproducibility standard deviation (among different labs) for contour method residual stress measurement is found to be very similar to repeatability standard deviation (in a single lab) reported in prior work. The reproducibility observed here, for the entire measurement process, is also similar to that found in a prior reproducibility study limited to contour method data analysis.

1. Committee Logistics
   1. Add a subcommittee?
   2. Articulation with Other Professional Groups  
      Need to discuss at next meeting

Screen shots below taken during the ASM-RSTC meeting on Feb 23, 2022

Graphical user interface, website

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