11th European Conference on Residual Stresses

Praha, Czech Republic, June 3-7, 2024

Contents

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http://www.xray.cz/ecrs11

ECRS-11 registration system

https://www.conftool.com/ecrs11/

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Notes to Scientific Programme

Tutorials

Residual stresses in additive manufacturing

The determination of residual stress in additively manufactured materials is a challenge, even after decades from the establishment of the basics of residual stress analysis. This is due to the peculiar microstructure of such materials. In fact, researchers have discovered that conventional methods for the determination of RS in materials do not properly work for AM materials. In this tutorial, the basics of RS analysis will be explained, together with the basics of AM manufacturing techniques. The microstructure of the peculiar materials (AM) dealt with here will be elucidated. Successively, the necessary modifications to the conventional approaches to RS analysis will be explained and case studies will be displayed, for the attendant to touch with hands the peculiarities of the approaches. Finally, a few experimental and theoretical tips will be given on dos and don'ts for a correct determination of RS in AM materials.

Quantification and uncertainties in residual stress measurement

Measuring the residual stress levels is essential for validating finite element modelling efforts and developing efficient stress mitigation strategies. But a measurement is never better the uncertainty you can assign to it. In this tutorial, we will discuss how residual stress levels are measured using different techniques - and which uncertainties and error bars that should be associated with the most common residual stress measurement techniques used in industry. The presentations will include benchmark studies and round robin proficiency testing and deliver a status of the standardisation efforts in Europe and the US.

ECRS-11

It is our pleasure to welcome you at the 11th edition of the European Conference on Residual Stresses - ECRS11 which will take place in Prague, Czech Republic, June 3-7, 2024.

ECRS is a well-established conference series that focuses on residual stresses in structural and functional materials. From experimental methods via modelling techniques to industrial applications a broad gamut of residual stress-related topics is addressed. The series is well attended by scientists, PhD students and engineers from both academia and industry. Previous editions have been successfully held in Karlsruhe (1983), Darmstadt (1990), Frankfurt/Main (1992), Cluny (1996), Delft (1999), Coimbra (2002), Berlin (2006), Riva del Garda (2010), Troyes (2014) and Leuven (2018).

This gathering brings together scientists, students, and engineers with a shared interest in Residual Stresses, a phenomenon that affects the physical properties of materials and surfaces across various scales. While its core focus lies in mechanical engineering and materials science, Residual Stresses also hold relevance in solid-state physics, life sciences, geology, and the chemical reactivity of solids. Managing residual stresses can unlock improved material and structural properties, such as enhanced fatigue life and geometrical stability. The analysis of residual stresses, being a highly sensitive parameter influenced by micro/nano-structure, provides valuable insights into the history of materials and structures. This conference offers an interactive platform for experts from diverse disciplines including mechanics, physics, optics, chemistry of solids, manufacturing, diffraction, and engineering. Attendees can exchange their perspectives and share recent advancements through experimental, theoretical, and numerical approaches.

Codes of Contributions

X - n

PL	Plenary Lecture (50 min.)	n - number of lecture (poster) in the session (group)
KL	Keynote Lecture (30 min.)	
EL	Exhibitor Lecture (20 min.)	
Sm	Session (m number of session), one lecture 20 min.	
Pm	Poster (m number of poster group)	

Length of each lecture includes time for discussion (~ 5 min).
Posters should be displayed for the whole conference.