R-TECH MATERIALS

Sarah Bagnall

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SUMMARY

- Materials engineer specialising in materials failure analysis.
- Chartered Engineer and professional member of the Institute of IOM3.
- Chair of the Wales & South West Institute of Corrosion Branch.
- Conducted over 700 failure investigations covering both metals and polymer and composite materials.
- Specialist in the thermal degradation of austenitic steels.
- Expertise in corrosion mechanisms within the chemical processing and petrochemical industries.
- Cardiff University Bond Solon Expert Witness Civil Certificate (2022)
- Experience and expertise in undertaking expert witness cases

CURRENT POSITION

Director - Consultancy Services at R-TECH Materials, based in Port Talbot, South Wales.

Sarah is a materials engineer and Chartered Engineer specialising in failure analysis particularly for the petrochemical, process and power generation industries. Sarah is currently the Director of the Consultancy business, managing the operational activities of the business in addition to the investigative materials engineering work. Sarah is also currently the chair of the Wales & South West Institute of Corrosion Branch. With over 700 failure investigations conducted, Sarah has broad experience with a wide range of engineering components, metallic and non-metallic materials, and industries. Sarah has extensive expertise in corrosion of a wide range of materials, particularly for the chemical processing and petrochemical industries. In addition to failure analysis, her role also includes product development support, liability concerns and general material quality issues. Sarah has experience in a wide range of metallic materials including carbon and stainless steels, copper-based alloys, nickel-based alloys, titanium, aluminium, and tantalum. Sarah also has experience in polymer and composite materials and recently acted as an expert witness for the failure investigation of GRP water tank panels.

Over the last 10 years, Sarah has developed specialist expertise in the thermal degradation of austenitic steels, which originated from a Masters' degree that focused on the development and relationship between the microstructural evolution of austenitic steels and mechanical properties. As part of the Master's, Sarah developed a microstructural classification system for austenitic steels, from which a research paper was published and now used as reference. Following this, Sarah project managed two Innovate UK funded research projects, with a combined quarter of a million value, one of which was in partnership with EDF Energy to develop a condition-based Structural Integrity Remaining-Life model for austenitic stainless steels, from a which a second research paper was published.

EDUCATION & PROFESSIONAL QUALIFICATIONS

- Chartered Engineer since 2015.
- 2010. Staffordshire University. BEng (Hons) 1st Class in Forensic Engineering.
- 2012. Swansea University. Masters by research studying the thermal degradation of austenitic stainless steels.
- Professional Member of the Institute of Materials, Minerals and Mining.
- Cardiff University Bond Solon Expert Witness Civil Certificate (2022)

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PUBLISHED PAPERS

Development of a Classification System for the Microstructural Evolution of Austenitic Stainless Steels." Engineering Structural Integrity Assessment: Where are we today? 2014. SL Bagnall, AWB Reed, JM Brear.

Carburisation and metal dusting in fired heaters and steam methane reformers: plant integrity issues. A R Franks, S L Bagnall, J M Brear, J Williamson, P Conlin. Materials Performance & Welding Technologies. 2017.

The effect of microstructural evolution on the impact and tensile properties of certain 300 series stainless steels. Bagnall S, Reed A. Brear J M. HIDA 2017.

WORK EXPERIENCE

July 2008 to September 2009:

Industrial Placement Metallurgist, Minton Treharne & Davies Ltd

During the degree, Sarah completed a placement year as a metallurgist for a consultancy company predominantly carrying out failure analysis and routine metallurgical examination of titanium components from aerospace engines. During the placement year Sarah learnt the basics of metallurgy which included metallurgical preparation, etching, examination of various materials and interpretation of their microstructures. Sarah was also involved with the mechanical testing including tensile testing, hardness testing and Charpy impact testing.