

The University of Manchester
 Faculty of Science & Engineering
 School of Natural Sciences
 Department of Materials



The University of Manchester

Professor Dirk Lars Engelberg

Name (e-mail):	Dirk Lars Engelberg (Dirk.Engelberg@manchester.ac.uk)
Education:	2002-2006 PhD Metallurgy & Materials Science, University of Manchester (UK) 2000-2001 MSc Corrosion Science and Engineering, UMIST (UK) 1996-2000 Diplom-Ingenieur (FH) Surface Engineering & Materials Science, University of Aalen (Germany)
Society Membership:	Fellow of the Higher Education Academy (FHEA); ISE - International Society of Electrochemistry; IOM ³ - Institute of Materials, Minerals & Mining, ICorr – Institute of Corrosion.
Present:	Appointed 08.2020: <i>Professor in Materials Performance & Corrosion</i>
Previous:	2015-2020 <i>Senior Lecturer in Materials Performance & Geological Disposal</i> 2010-2015 <i>BNFL Endowed Lecturer in Materials Performance & Geological Disposal</i> 2005-2010 <i>Post-Doctoral Research Associate (PDRA)</i> , School of Materials, UoManchester
Affiliations:	Department of Materials, Corrosion@Manchester, Dalton Nuclear Institute (DNI), Sellafield Effluent & Decontamination Centre of Expertise (SEDCoE).
	
Apprenticeship:	1991-1994 Electroplater - Certification (German Chamber of Commerce - IHK 1994)
Employment	1994-1995 Employment Electroplater (Metalex GmbH; Weinbrecht & Kuecherer GmbH)
Researchgate Profile:	https://www.researchgate.net/profile/Dirk_Engelberg
Linked-in Profile:	https://www.linkedin.com/in/dirk-engelberg-a790b267/ (>4300 Followers)

Position & Affiliation: Full Professor in Materials Performance & Corrosion (Teaching & Research), (ii) Manchester Gold Mentor & Presidential Fellowship Mentor, (iii) Senior Corrosion Lead - Corrosion@Manchester, (iv) European Federation of Corrosion (EFC) Elected Vice Chair WP5 - Environment Sensitive Fracture, (v) SEDCoE – Decontamination Lead.

Technical Specialisation: Electrochemistry, Localised Corrosion, Environmentally Assisted Cracking (EAC), Metallurgy, Microstructure & Manufacturing, Characterisation & Sensing Techniques, Decontamination, Surface Engineering, Innovation in Research & Engineering.

Research: Most of my work is centred on problem-solving, applied science, working at the interface of science & engineering. My research addresses the development of resilient approaches for the mitigation of corrosion, material degradation, and environment-assisted cracking. This includes the durability, performance and functionality of steels, stainless steels, Ni-base, and Al- alloys in hydrogen-containing applications (gas, aqueous, in solids - atomic, ionic, molecular), for radwaste storage & waste disposal exposures, petrochemical and marine environments. I also develop new approaches to optimise hydrogen-material interactions (hydrolysis, electrolysis, de-coupled water splitting, etc.) and innovative ways to analyse and characterise hydrogen in metals. All these ideas combine knowledge of electrochemistry, surface analytics, metallurgy and novel material characterisation techniques, bridging into 3D experiment design, 3D/4D X-ray Computed Tomography (X-ray CT) and rapid 3D surface scanning techniques.

Innovation: (i) rapid, fast, local detection of hydrogen content in materials, (ii) on-site electrochemical measurements and sensing techniques (local electrochemistry, pen electrodes); (iii) development of novel corrosion sensing tests & high-throughput approaches (bipolar electrochemistry, gradient electrochemistry, hyper-spectral imaging); (iv) development of material durability studies in highly alkaline, highly acidic, marine & hydrogen-containing environment; (v) single electrode bipolar electrolysis.

Research Projects & Current Topics (2026):

- In-Situ Imaging and Chemistry Mapping of Corrosion Processes in Product Store Environment;
- Corrosion of Stainless Steels in HCl Containing Vapour;
- Investigating the Physico-Chemical Effects of LIBS on Nuclear Containment Materials;

- Capability Development for Probing AGR Fuel Cladding Performance Using Raman Spectrometry;
 - Bipolar Electrochemistry for Probing the Effect of Hydrogen Embrittlement on Stress Corrosion Cracking;
 - Development of a New Approach to Prevent Hydrogen Embrittlement (HE) in Aluminium Alloys;
 - Hydrogen Retention in Metals under Cryogenic Exposure;
 - Linking Corrosion and Hydrogen Adsorption to Surface Passive Film Properties;
 - Elucidating Steel Corrosion Rates in High-salinity Groundwater – A Multi Technique Approach;
 - Towards Controlling Atmospheric Corrosion of Aluminium Alloys in Nuclear Store Environment;
 - Zinc Undercoating for Hydrogen Barrier Application;
 - Non-contact Electrochemical Decontamination of Legacy Pond Furniture;
 - Laser Repair Processes for Remote In-Situ Operations in Future Power Plants.
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Publication Record: H-index 40 (googlescholar); 175 Manuscripts, Book Chapters & Conference Papers.

Latest Publications & Sneak Preview (02.2026):

- Sanchez, C., Banister, A., Engelberg, D.L.: Towards Understanding the Effect of Surface Residual Stress on Atmospheric Chloride-Induced SCC of Austenitic Stainless Steels. *Corrosion Science* (*under review).
- Bharati, B., Engelberg, D., Unluer, C.: Steel corrosion in MgO-SiO₂ binder concrete: Effect of long-term exposure and accelerated CO₂ exposure. *Cement and Concrete Composites* (*under review)
- Rose, M., Boothman, C., Bailey, M., Engelberg, D.L., Morris, K., Shaw, S., Lloyd, J.R (2026): Selenium Reduction and Immobilisation by Bentonite-Native Microbial Communities. *ACS Environmental Science & Technology*. <https://pubs.acs.org/doi/abs/10.1021/acs.est.5c09387>
- Attar, H., Zhou, Y., Roy, M., Fellowes, J. W., Hossein, V. A., & Engelberg, D. (2025): Application of Corrosion Test Methods for Microstructure Screening of WAAM Duplex Stainless Steel. *Electrochimica Acta*, 534(September 2025), Article 146564. <https://doi.org/10.1016/j.electacta.2025.146564>

Section Editor: Shreir's Corrosion Handbook – Volume 2: High Temperature Corrosion, Elsevier Publishing – Scheduled for publication for end-2026.

Latest Award: 2024 European Federation of Corrosion / Working Party 4 Nuclear Corrosion - Henri Coriou Award - Award for outstanding contributions to corrosion science and engineering in the nuclear field.

Teaching (01.26): (i) Principles of Corrosion (Electrochemistry & Corrosion, MSc); (ii) Materials Shaping the World (Yr1 MSE - Corrosion Introduction); (iii) NTEC - Nuclear Technology Education (MSc - Reactor Materials N06); (iv) Foundation Year Projects.

Teaching Experience: across all levels of higher education teaching, from pre-UG courses (Foundation Year), at UG level (Year1-Year4 Materials Science/Manufacturing), MSc level (Corrosion, Advanced Materials, Polymer), PhD/EngD Doctoral College Teaching (Centre for Doctoral Training), to provision of industry courses CPD (Continuing Professional Development).