



UNIVERSITY OF  
**LEICESTER**

Poster 11

## *Experimental investigation of the effects of cryogenic treatments on the corrosion and tribocorrosion resistance of structural steels*



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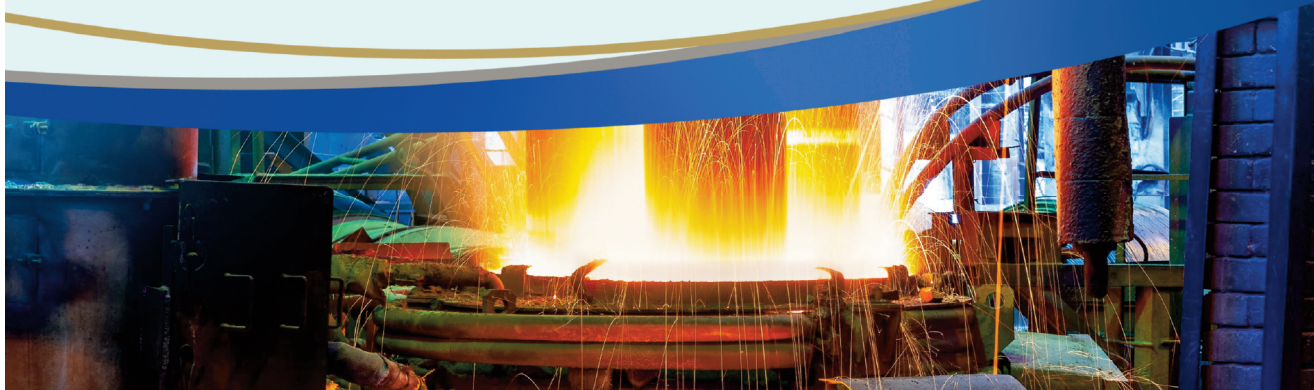
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*ABSTRACT:*

Tribocorrosion is a significant cause of material degradation, necessitating an effective approach to enhance a material's resistance and protection. Current approaches rely on surface modification, which, while promising, is complex to implement and susceptible to premature damage, requiring ongoing maintenance - an additional financial burden. Cryogenic treatment, a well-established technique for enhancing steel wear resistance, offers a compelling solution, as recent studies have independently highlighted its potential to improve corrosion resistance. Our research aims to investigate the supposed improvement in corrosion resistance and subsequent tribocorrosion resistance. One such promising steel is SA508-4N, a nuclear pressure vessel steel. If successful, cryogenic treatment could be a cost-effective and straightforward alternative for tribocorrosion protection. We will utilise potentiodynamic polarisation techniques to study the corrosion behaviour, SEM imaging to characterise the corrosion surface and XRD to analyse the microstructure, providing valuable insights into potential microstructural alterations that could enhance corrosion resistance.



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