PhD Scholarship Opportunity in *Steel Welding* within the ARC Research Hub for Australian Steel Manufacturing

**BACKGROUND**

The Steel Research Hub will be the centerpiece for collaborative steel research in Australia, striving to deliver breakthrough product and process innovations that will enable the Australian Steel Industry to compete on a global stage. For more on the Steel Research Hub visit our website at: [http://steelresearchhub.uow.edu.au](http://steelresearchhub.uow.edu.au)

**THE PROJECT**

We are seeking a PhD candidate with a background in Materials/Welding Engineering to engage in a Steel Research Hub funded project “The behaviour of advanced Q&T steels during arc welding and thermal cutting” commencing in 2017.

One main fabrication attribute for quenched and tempered (Q&T) high hardness wear products is resistance to delayed cracking due to hydrogen assisted cold cracking, particularly post thermal cutting. This project aims to assess the potential of a Q&T high hardness wear grade based upon a high titanium steel type to provide more favourable fabrication characteristics than conventional high hardness wear grades. In particular, the capability to thermally cut and weld a Q&T high hardness wear grade based on a high titanium steel type (~0.4% Ti), using conventional thermal cutting and weld processes used for fabricating wear plate for the mining industry, in comparison with a conventional high hardness wear grade. The project also aims to assess the quality of the weld region and the toughness of the weld heat affect zone and weld metal in comparison with a conventional high hardness wear grade.

The solubility of titanium carbide particles in a medium carbon level steel should be quite low even at the melting point of iron. This should restrict the carbon level in the martensite, and hence reduce the hardness of the matrix martensite and therefore lower the propensity for hydrogen assisted cold cracking, either post thermal cutting or welding. The project aims to develop an understanding of the behaviour of the TiC particles during the thermal cutting and welding cycles.

**REQUIREMENTS**

The successful applicant will be expected to hold at least an Honours 1 (or equivalent) degree in Engineering. For overseas applicants, an IELTS score of 6.5 is required.

Experience in steel processing/fabrication, particularly welding metallurgy are essential for the research. A background relevant to materials characterisation and mechanical tests is desirable.
HOW TO APPLY

Applicants should submit a CV clearly showing education (with an academic transcript) and research experience.

Applications close on 10 February, 2017

For further information, or to apply, contact Prof Huijun Li, School of Mechanical, Materials and Mechatronics Engineering, Faculty of Engineering, University of Wollongong.

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