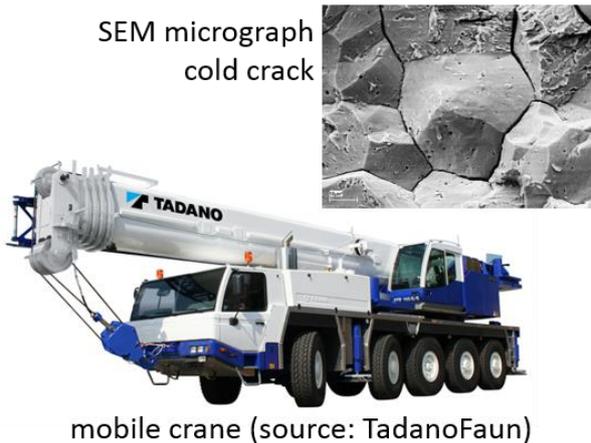


Subject: Arc welding of high-strength steels with special attention to the risk of hydrogen-induced cold cracking



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Type of thesis:

Bachelorthesis	X	Experiments	X
Projectthesis	X	Construction	
Minithesis		Theoretical	X
Masterthesis	X	Literature research	X

Beginn: according to agreement

Fachbereich:

Arc welding

Topic:

High-strength steel grades are preferably used in a wide range of applications such as mobile crane or pipeline construction. However, there is a danger during the welding processing (usually arc welding) of these steels due to the possible occurrence of so-called hydrogen-induced cold cracks (HICC). Especially in the case of high-strength steel materials, the avoidance of cold cracks cannot always be reliably guaranteed, even in compliance with existing regulations, since the existing avoidance concepts were developed primarily on the basis of steels from other alloying concepts and lower strength classes, and the current state of knowledge does not permit a comprehensive evaluation of the parameters influencing the crack formation phenomena.

Hydrogen input into the welding zone during arc welding is influenced by the selected welding parameters, the state and chemical composition of the materials involved (welding filler metal, base metal, auxiliary materials) as well as their geometry and temperature control. The structure and the state of stress also play a decisive role here.

Within the scope of this work, a contribution to the welding processing (GMAW or submerged arc welding) of high-strength steels with special attention to the hydrogen-assisted cold cracking is to be made.

Your profile:

Student of mechanical engineering, materials engineering or related studies. Basic knowledge of materials science is favoured, knowledge of welding technology is not a prerequisite.

If you are interested or if you have any questions, please don't hesitate to contact me!

Best regards,
Martin Christ