

New science approach to revolutionize welding

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This is Dr. Hong Dong of the department of engineering at the University of Leicester. Credit: University of Leicester

A multi-million pound engineering research project is using advanced thinking to revolutionise the welding industry - and offering the prospect of saving lives.

The University of Leicester is spearheading the €4.8 million project funded by the European Community's Seventh Framework Programme which involves 11 partners from seven countries.

Failure of welds can start from minute imperfections but lead to major cracks and flows. The eleven European collaborators will therefore attempt to understand the process better over this wide range of scales using computer modelling incorporating knowledge gained from state-of-the-art laboratory and industrial experiments.

This will be used to develop the technology for welding deep-sea gas and oil transportation systems, a new computer modelling approach as opposed to a traditionally experimental method.

The joint research venture, MintWeld, will take place over a four-year period, with an aim to aid the manufacturing industry through the development of a commercial package.

MintWeld consortium leader, Dr Hong Dong from the University of Leicester's Engineering Department, said: "Welding is the most economical and effective way to join metals permanently, and it is a vital component of our manufacturing economy. It is estimated that over 50% of global domestic and engineering products contain welded joints. In Europe the welding industry has traditionally supported a diverse set of companies across the shipbuilding, pipeline, automotive, aerospace, defence and construction sectors.

"The project is highly valuable given the potential catastrophic consequences a disaster would create, as exhibited in the 1980 Norwegian Alexander Kielland wreck in which 123 lost their lives due to a faulty 6mm weld.

"Failures in welded components, such as deep-sea oil and gas transport systems, can result in lost production valued in several billion Euros, whilst exposing the EU to increased petroleum prices and increasing EU dependency on oil and gas supplies from other regions.

"This project will deliver an accurate, predictive, and cost-effective modelling tool that will find widespread application in the relevant European metals industry for penetrating novel markets of high economic and strategic importance - an essential task to ensure that Europe maintains its competitiveness.

"The scientific aspects of this project are exciting but challenging. We are collaborating with the best people in their field to achieve maximum benefit for the manufacturing industry. It will be exciting when we all come together and a synergy develops from this collaboration."

Source: University of Leicester ([news](#) : [web](#))

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