Evaluating the Field Kelvin Probe as a Stress Detection Device

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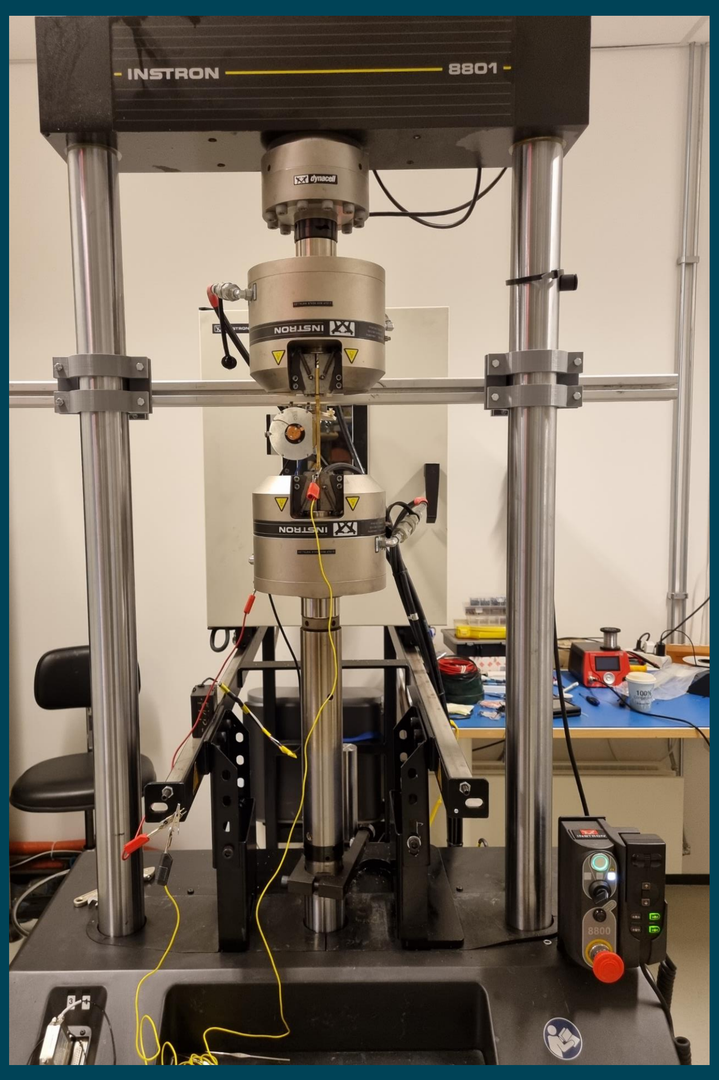
› M10-General Mechanical Engineering

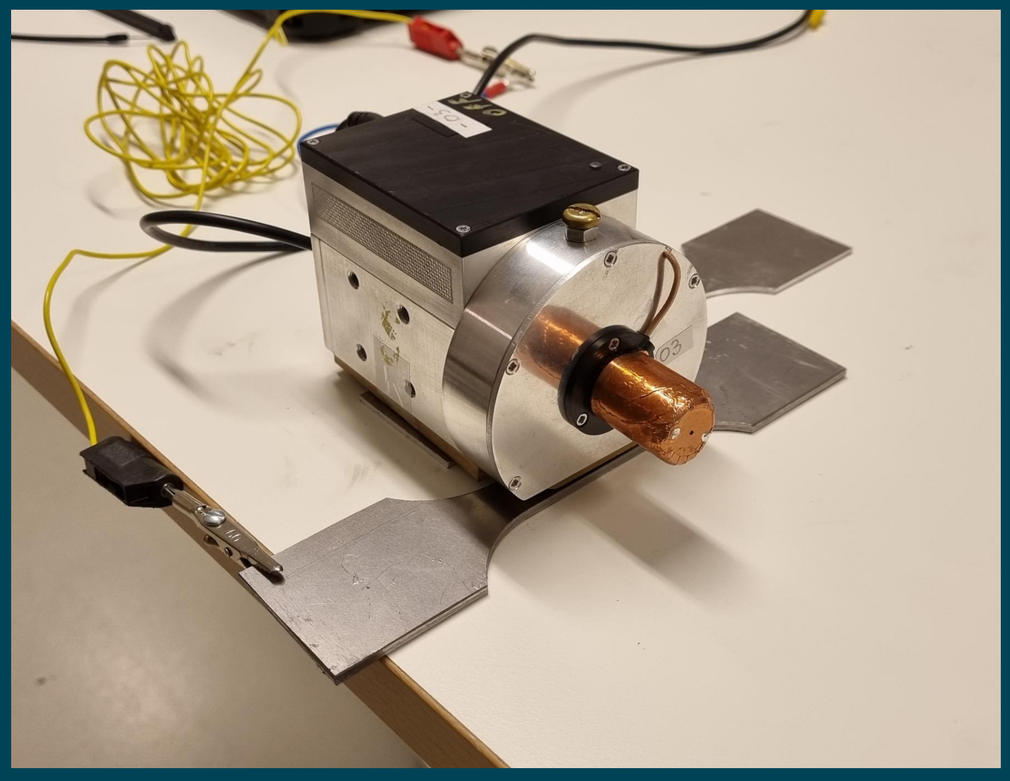
Department of Mechanical and Marine Engineering

The goal:

It has been proposed that applied stress could change the work function of a metal. If this is true it could lead to a whole new way of measuring stress. Using the newly developed FKP, we started on a research project, determined to find out this method would work under real circumstances.



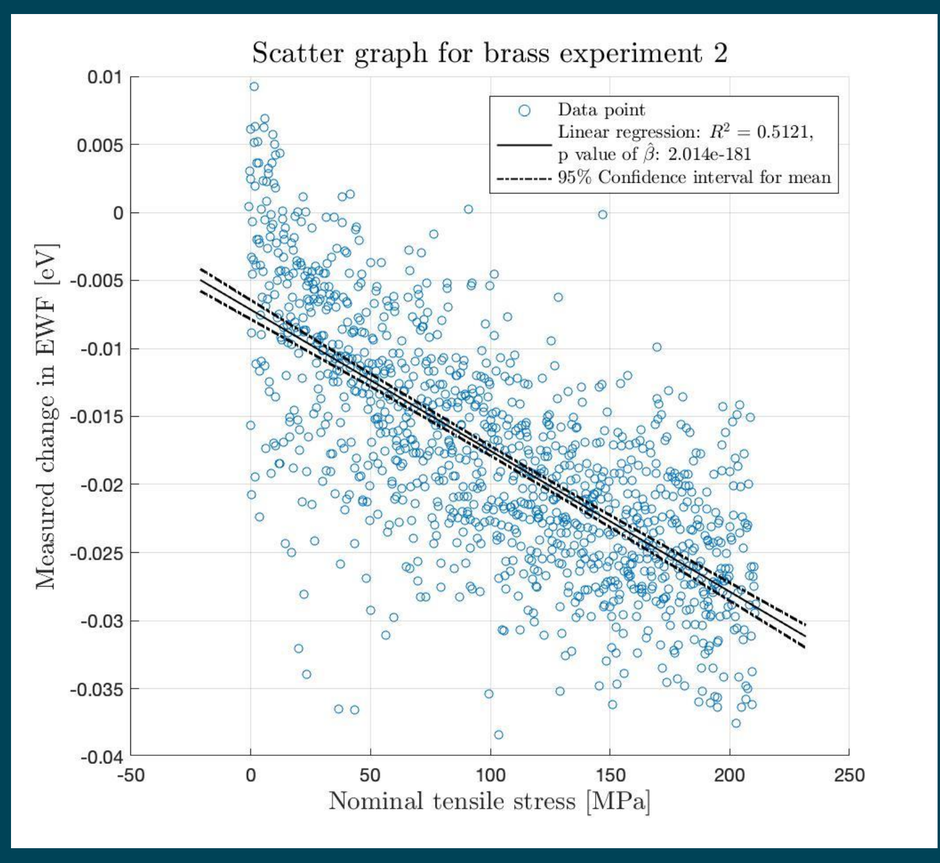
Instron test setup



FKP with sample.

Methodology:

To conduct the experiments, the probe was attached to the university's servo-hydraulic testing machine. The probe would measure continuously while an increasing load was applied to a sample. Data was collected and the known change in load would be compared to the probe data using consistent statistical tools to determine their relation.



Graphed test data

Results and conclusion:

While it is speculated that stress could change work function, it is known that a lot of other factors do change it. This makes it hard to determine exactly what causes the changes in the measurements, and makes us unable to present a definite conclusion. However, the observations made during testing leads us to propose FKP as an instrument for detecting fatigue and overstressing in metal parts.

Høgskulen på Vestlandet

expo

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