# Article information:

On the determination of residual stress and strain fields by sharp indentation testing.: Part II: experimental investigation - ScienceDirect
<https://www.sciencedirect.com/science/article/pii/S1359645401001239>

# Article summary:

1. Residual stresses and strains can be unintentionally introduced into materials during manufacturing, and various experimental measuring techniques have been developed to take these effects into consideration in the design procedure.

2. A non-destructive and simple experimental procedure for measuring residual surface stresses/plastic strains using sharp indentation testing was suggested in a parallel theoretical/numerical investigation by Carlsson and Larsson.

3. The present study investigates the practical limitations of the suggested method experimentally, including the combined effect of residual stress and residual strain, and a more general case of residual stress fields.

# Article rating:

Appears moderately imbalanced: The article provides some useful information, but is missing several important points or pieces of evidence that would be required to present the discussed topics in a balanced and reliable way. You are encouraged to seek a more balanced perspective on the presented issues by exploring the provided research topics and looking at different information sources.

# Article analysis:

The article discusses a non-destructive and simple experimental procedure for measuring residual surface stresses/plastic strains using sharp indentation testing. The method proposed by Carlsson and Larsson is based on the behavior of global properties, i.e., hardness and the ratio between actual and nominal contact area, given by a sharp indentation test. The article provides a theoretical background to support the proposed method and explains how it can be used to investigate residual stress and strain fields.

However, the article has some limitations that need to be considered. Firstly, the article relies heavily on previous studies without providing enough evidence to support their claims. For example, the authors mention several experimental measuring techniques developed for determining residual stresses and strains but do not provide any evidence or references to support their effectiveness or limitations.

Secondly, the article does not explore counterarguments or alternative methods that could be used to investigate residual stress and strain fields. This limits the scope of the study and may lead to biased conclusions.

Thirdly, while the authors acknowledge that extensive experimental studies are needed to verify their results, they only present two types of experiments performed in this study. This limited sample size may not be representative of all materials or situations where residual stress and strain fields are present.

Finally, there is no discussion of potential risks associated with using sharp indentation testing as a non-destructive method for investigating residual stress and strain fields. This omission raises questions about whether this method is safe or reliable for use in practical applications.

In conclusion, while the proposed method for investigating residual stress and strain fields using sharp indentation testing shows promise, more research is needed to validate its effectiveness across different materials and situations. Additionally, further exploration of alternative methods should be considered to ensure unbiased conclusions are drawn from future studies.

# Topics for further research:

* Experimental techniques for measuring residual stresses and strains
* Limitations of sharp indentation testing for investigating residual stress and strain fields
* Alternative methods for investigating residual stress and strain fields
* Risks associated with using sharp indentation testing as a non-destructive method
* Validation of sharp indentation testing across different materials and situations
* Theoretical background on residual stress and strain fields

# Report location:

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