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Rapid methodology for mechanical property evaluation of construction steel

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Keywords:

Construction steel, Mechanical properties, Rapid evaluation, Stress-strain curves, Material testing, Plastic deformation, Structural steel, Static loads, Steel calibration

Abstract:

The object of research is construction steel, focusing on its mechanical properties, including strength, ductility, and resistance to deformation under static loads. The goal of the study is to develop and validate a rapid methodology for evaluating these properties without compromising accuracy or reliability. **Method**. The methodology involves combining a streamlined material testing approach with stress-strain curve analysis. Advanced calibration techniques and simplified constitutive modeling are employed to estimate the mechanical behavior of steel. Computational tools are used to validate the findings and optimize the evaluation process, ensuring minimal time consumption while maintaining precision. **Results**. The proposed methodology demonstrated high reliability in determining key mechanical properties, including yield strength, ultimate strength, and ductility. The results align with those obtained from traditional testing methods, confirming the efficiency of the approach. Additionally, the methodology provides a cost-effective solution suitable for routine evaluations in construction steel applications, facilitating quicker decision-making in quality control processes.

1 Introduction

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2 Materials and Methods

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3 Results and Discussion

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4 Conclusions

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5 Acknowledgements

Text, text, text

6 Fundings

Text, text, text

7 Conflict of Interests

Text, text, text

References

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