Booklet of Abstracts

1st International Conference on Mathematical Modelling in Mechanics and Engineering

Editors:
Ivana Atanasovska
Milan Cajić
Danilo Karličić

Mathematical Institute of the Serbian Academy of Sciences and Arts
Belgrade, 08.-10. September 2022.

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ANALYTICAL MODELING OF HARDNESS IN THE HEAT AFFECTED ZONE DURING WELDING A PLATES MADE OF STEEL P355GH BY GMAW PROCESS

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ABSTRACT

The quality of the welded structure is often assessed on the basis of the value of hardness in the heat affected zone (HAZ). These property of quality and reliability is very important to be determined as accurately as possible using analytical methods. Main purpose of investigations performed here is to gain insight into the accuracy and applicability of available analytical models which are significantly faster and simpler than numerical ones. The prediction of hardness value in HAZ at some distance from the surface of plate, based on the different analytical models of temperature filed, was carried out. One of the most important parameters that affect the value of hardness - time $\Delta t_{8/5}$, was determined based on above mentioned 3D analytical models of temperature field. The hardness values distribution was determined experimentally after the plates made of steel P355GH are welded by GMAW process. Comparisons between analytical and experimental results were carried out and conclusions have been drawn.

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