

Hot Press Forming of 22MnB5 Steel Using Full Factorial Design of Experiment (DOE)

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ABSTRACT

This paper presents optimisation of hot press forming using design of experiment for high hardness properties at maximum cooling water temperature and minimum quenching time. Samples were boron steel blanks of 60x50 mm dimension. Hot press forming was conducted using a hydraulic press machine with 20 tonne maximum load. Results of this research work show that parameters obtained by single response optimization through desirability analysis route will increase hardness by 66.72%. The hardness properties of samples were between 477 and 551.4 HV (0.1). These findings were important to design tailored ultra-high strength automotive components at different process parameter settings and to reduce production cost consumption and improve production rate.

KEYWORDS: 22MnB5 Boron Steel; High Strength Steel (HSS); Hot Press Forming

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