Abstract

This paper introduces an excellent merge of Soft computing techniques from Computer Science Engineering, Plasma Technology and Material Surface Engineering. The paper is mainly focused on the Case Based Reasoning (CBR) approach for plasma nitriding process in the prediction of the values of the process parameters for different alloyed steels based on the actual data available from number of high-cost processing experiments. For different grade alloying steel-materials a number of process parameters have to be adjusted to get requisite surface hardness and case depth in the plasma nitriding process, which includes sample temperature, process time, working gas pressure, gas composition etc. needed to be maintained in the optimal conditions. In practice, in the laboratory, it is usually achieved through hit-and-trial method and intuition, which becomes difficult for large-volume and large-scale plasma nitriding experiments to bear the cost. It is demonstrated that the CBR based computational reasoning can minimize the monetary losses and physical efforts in identifying the process parameters for those steel-materials for which such parameters are not currently available. The utility and implementation of CBR for the surface hardening of steel in a Plasma Nitriding process is justified. It is expected that the suggested methodology would prove a successful achievement in the plasma nitriding technology and also on the other emerging
Parameter Prediction through Soft PIN System in a Plasma Ion Nitriding Steel Hardening Unit

trends and technologies of industrial relevance.

References

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Index Terms

Computer Science

Artificial Intelligence

Keywords

Soft Computing  Case based reasoning  plasma ion nitriding (PIN)  Soft Plasma Ion Nitriding System