

## Surface hardening of tool steel by plasma arc with multiple passes

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### Abstrak

Plasma arc surface hardening is an alternative selective surface hardening method that is effective, economical and a promising technology in heat treatment industries. In the present work, an investigation was carried out to study the hardness distributions of multiple passes in surface hardening of tool steel by plasma arc. The effects of multiple passes with overlapping and non-overlapping scans were investigated. The results show that the hardness is higher at centre of the plasma arc hardening tracks, and then decreasing in the region adjacent to each plasma arc track. It was found that the formation of hardened zone hardness in multiple passes non-overlapping scan is more uniform on the each scan when compared to the overlapping scan. However, hardness distribution of overlapping scan in width direction shows that it was more uniform compared with non-overlapping scan.