COMPARISON OF PLASMA TRANSFERRED ARC AND SUBMERGED ARC WELDED ABRASIVE WEAR RESISTANT COMPOSITE HARDFACINGS

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In the majority of wear parts applications there is a great demand for hard materials with superior wear resistance in the form of coatings or hardfacings [1]. Hardfacing procedure can be used for the production of new overlays as well as for restoration of worn surfaces [2]. Different types of welding, brazing, powder metallurgy (liquid phase sintering), laser-cladding, thermal spraying, etc., are widely used for the production of hardfacings [3].

Experience has shown that composite hardfacings produced by Plasma Transferred Arc Welding (PTAW) and Submerged Arc Welding (SAW) possess a good combination of hardness, wear resistance and fracture toughness, thus providing high wear resistance. Although they cannot substitute and be compared with conventional WC-Co based hardmetals, they still can be used in many applications where high wear resistance, hardness and toughness are in great demand. In this study two different hardfacing production technologies, PTAW and SAW, were used to produce the hardfacings for abrasive wear conditions. In both cases hardfacings were welded on the top of low alloy steel using different proportions of disintegrator milled hardmetal WC-Co powder of different fractions as a reinforcement and self-fluxing alloy as a matrix. They were analysed in regard to Rockwell and Vickers hardness, wear behaviour, and microstructural analysis. Both types of hardfacings have shown promising results in intensive wear: abrasive emery wear and abrasive wheel wear conditions.

References

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