

INTERNATIONAL CONFERENCE

ON

METALS AND ALLOYS:
PAST, PRESENT AND FUTURE

METALLO-2007

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Indian Institute of Technology Kanpur

Abstracts of Contributed Papers

P-68

Microstructural Study of Galvanized Coatings Formed in Pure as well as Commercial Grade Zn Baths

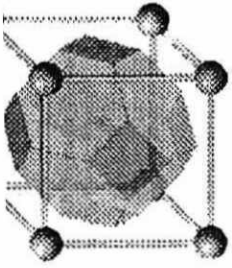
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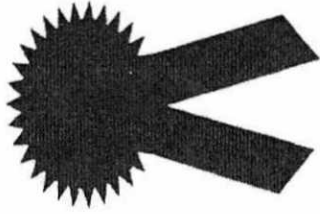
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The hot dip galvanizing is a complex metallurgical process wherein a steel strip is immersed in a zinc alloy bath normally between 450 and 480⁰C. The protective coating that is formed consists of a series of intermetallic Fe–Zn compound layers, which have been identified as gamma (Γ), delta (δ), zeta (ξ) and an outer eta (η) layer, highly rich in Zn. There is no apparent delay in the formation of ξ or δ phases (less than 5 s reaction time) in pure Zn bath as well as the commercial grade Zn bath. The gamma (Γ) phase is formed after an incubation time of 30 s at a bath temperature of 470⁰C in the pure Zn bath. The formation and growth of Γ phase, however, is delayed in the commercial grade Zn bath. The last morphological feature is the formation of a second ξ layer at the ξ/δ interface in reaction time above 30 s. Presence of Pb in the commercial grade Zn bath seems to increase the overall coating thickness. Commercial grade Zn, however, enhances the dross formation in the bath and deteriorates the quality of the coating. Presence of transverse cracks as well as entrapment of dross particles in these coatings is attributed to the less compact coatings that are formed in the commercial grade Zn baths. The present investigation is an effort to have a better understanding of the kinetics of growth and morphology of the coatings during the galvanizing process in the pure as well as commercial grade Zn baths.

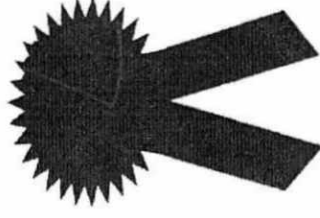


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Award Certificate
G. R. Mandal, D. Mandal,

This is to certify that *S.K. Das, R. Balasubramaniam & S.P. Mehta* of
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awarded the..... **SECOND**..... prize for poster presentation in the
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Technology Kanpur during December 7-10, 2007.


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