

## 용융 Zn 합금에서 Fe합금의 PTA 오버레이 용접 금속간 상의 형성과 진행

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## Formation and Progression of Intermetallic phase on Iron Base Alloy

## PTA weld overlay in Molten Zn Alloys.

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Gyeongsan 712-749, Korea***Abstract**

Zinc coatings provide the most effective and economical way of protecting steel against corrosion. There are three types of galvanizing lines typically used in production line in galvanizing industries, Galvanize (GI) coating (Zn-0.1-0.3%Al), Galfan coating (Zn-5%Al), Galvalume (GL) coating (45%Zn-Al). In continuous Galvanizing lines, the immersed bath hardware (e.g. bearings, sink, stabilizer, and corrector rolls, and also support roll arms and snout tip) are subjected to corrosion and wear failure. Understanding the reaction of these materials with the molten Zn alloy is becomes scientific and commercial interest. To investigate the reaction with molten Zn alloys, static immersion test performed for 4, 8, 16, and 24 Hr. Two different baths used for the static immersion, which are molten Zn and molten Zn-55%Al. Microstructures characterization of each of the materials and intermetallic layer formed in the reaction zone was performed using optical microscope, SEM and EDS. The thickness of the reaction layer is examined using image analysis to determine the kinetics of the reaction. The phase dominated by two distinct phase which are eutectic carbide and matrix. The morphology of the intermetallic phase formed by molten Zn is discrete phase showing high dissolution of the material, and the intermetallic phase formed by Zn-55wt%Al is continuous. Aluminum reacts readily with the materials compare to Zinc, forming iron aluminide intermetallic layer ( $Fe_2Al_5$ ) at the interface and leaving zinc behind.

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