The Influence of Residual Stress on Hardness and Microstructure in Railway Rails

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Abstract : In railway rails, residual stress was measured and the values of residual stress were associated with hardness and micro structure in this study. At first, three rails as one meter long were taken and residual stresses were measured by cutting method according to the EN 13674-1 standardization. In this study, strain gauge that is an electrical apparatus was used. During the cutting, change in resistance in rail gave us residual stress value via computer program. After residual stress measurement, Brinell hardness distribution were performed for head parts of rails. Thus, the relationship between residual stress and hardness were established. In addition to that, micro structure analysis was carried out by optical microscope. The results show that, the micro structure and hardness value was changed with residual stress.

Keywords : residual stress, hardness, micro structure, rail, strain gauge

Conference Title : ICMMPME 2014 : International Conference on Mining, Mineral Processing and Metallurgical Engineering **Conference Location :** Venice, Italy

Conference Dates : November 13-14, 2014

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