12、Metallic Coatings

Mechanism and control technology of C-warping defect in wide specification hot-dip galvanized ultra-high strength steel

Qiumusheng[1,2], Li yan[1,2], TENG Huaxiang[1,2], JIANG Guangrui[1,2], Liu Huasai[1,2], Han yun[1,2]

(1.Shougang Research Institute of Technology，Beijing 100041; 2. Beijing Key Laboratory of Green Recyclable Process for Iron & steel Production Technology, Beijing 100043)

Abstract：Expulsion is likely to occur when wide specification ultra-high strength steel is used by the customer. It is found that the poor uniformity of coating in the transverse direction is the main reason for expulsion. The coatings of upper and lower surfaces present a symmetrical "C" shape distribution along the width of the strip. When the strip passes through the immerse roll inside the zinc pot, the asymmetric deformation on the upper and lower surfaces of the strip causes a crossbow at the position of the air knife, resulting in a significant difference in the distance between the upper and lower surfaces of the strip and the air knife, as a result, poor uniformity of coating in the transverse direction is formed. Established a prediction model for C-warping defect and discussed the impact of hot-dip galvanizing cooling process on C-warping defect and its optimization technique.The analysis results show that the deviation between the forecasted and measured values of unit outlet strip shape can meet the requirements of product precision. The model can predict the strip shape of the processin the furnace in realtime, and provide theoretical guidance for the subseguent process parameter optimization. Sothe model has the value of further popularization and application.With the increasement of the correction roll insertion, the plate shape at the air knife position changes significantly. By optimizing the insertion of correction roll and the tension of cooling tower, ultra-high strength strip with uniform zinc layer can be got, which can solve the problem of expulsion during the spot welding.