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Process research on the stainless steel/low alloy steel clad plate prepared by vacuum hot rolling

Feng Ying Ying, Luo Zong An, Xie Guang Ming and **Hui Nan Mu**
Northeastern University, China

In this work, stainless steel/X65 pipeline steel clad plate was prepared by vacuum hot rolling technology. The influence of the interfacial microstructure and mechanical properties of stainless steel clad plate, and the corrosion resistance of 316L complex layer with different process of controlled rolling and cooling were studied. The process design basis for the production of clad plates with excellent properties for the production of clad pipes has been provided. Especially the combined interface was evaluated using optical microscope, scanning electron microscope (SEM) and transmission electron microscope (TEM). The resulting mechanical properties were also assessed by means of hardness and shear test. The results showed that with the increase of the reduction rate, the interface can be fully and effectively combined, the oxide at the interface was refined, and the bonding strength of the composite interface was improved. When the reduction rate was 80%, the interface bonding strength of stainless steel/X65 pipeline steel has reached 426MPa; the microstructure of X65 grains can be refined and can be changed into fine acicular ferrite, granular bainite and a small amount of polygonal ferrite via the controlled cooling after rolling process. The mechanical properties can be further enhanced. Also, with the increase of the reduction ratio, the inter-granular corrosion of 316L stainless steel became more detrimental. The controlled cooling after rolling process resulted in the improvement of the inter-granular corrosion, because of the shorter sensitizing temperature duration for the 316L stainless steel.

Biography

Feng Ying ying has completed her PhD from Northeastern University. She works as a Teacher in the Northeastern University, and has published more than 15 papers in reputed journals.

fengyy@ral.neu.edu.cn

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