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Thermo-Mechanical Processing of Armor Steel Plates

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Abstract : The steel contains 0.3% C and 0.004% B, beside Mn, Cr, Mo, and Ni. The alloy was processed by using 20-ton capacity electric arc furnace (EAF), and then refined by ladle furnace (LF). Liquid steel was cast as rectangular ingots. Dilatation test showed the critical transformation temperatures Ac₁, Ac₃, M_s and M_f as 716, 835, 356, and 218 °C. The ingots were austenitized and soaked and then rough rolled to thin slabs with 80 mm thickness. The thin slabs were then reheated and soaked for finish rolling to 6.0 mm thickness plates. During the rough rolling, the roll force increases as a result of rolling at temperatures less than recrystallization temperature. However, during finish rolling, the steel reflects initially continuous static recrystallization after which it shows strain hardening due to fall of temperature. It was concluded that, the steel plates were successfully heat treated by quenching-tempering at 250 ºC for 20 min.

Keywords : armor steel, austenitizing, critical transformation temperatures (CTTs), dilatation curve, martensite, quenching, rough and finish rolling processes, soaking, tempering, thermo-mechanical processing
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