Pengaruh suhu temper setelah quench terhadap struktur mikro, kekerasan dan jumlah retained austenite pada baja HSLA dalam industri alat berat = Effect of tempering temperature after quench on microstructure, hardness and amount of retained austenite on HSLA steel in heavy equipment industry

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Abstrak

Penelitian ini didasari adanya masalah crack pada produk bucket tooth yang menggunakan material baja HSLA di industri alat berat setelah 2 bulan pengiriman ke pelanggan(delayed crack). Penelitian sebelumnya mengemukakan bahwa delayed crack ini diduga akibat adanya austenite sisa yang bersifat metastabil. Austenite sisa dapat bertransformasi menjadi martensite sehingga terjadi peningkatan volume dan tegangan internal yang menyebabkan delayed crack. Penelitian ini berfokus mengurangi austenite sisa dengan variasi suhu tempering. Suhu temper yang digunakan adalah 155°C, 205°C, 255°C, dan 305°C Mikrostruktur menunjukkan adanya transformation zone yaitu daerah dimana transformasi fasa yang terjadi belum sempurna. Hasil dari penelitian ini menunjukkan jumlah austenite sisa dan nilai kekerasan menurun ketika suhu temper dinaikkan.

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This research is based on the problem of crack on bucket tooth products using HSLA steel material in heavy equipment industry after 2 months of delivery to customers (delayed crack). Previous studies have suggested that the delayed crack is thought to be due to metastable retained austenite. The retained austenite can be transformed into martensite which causes an increase in internal volume and stress resulting in delayed crack. This research focuses on reducing retained austenite with variations in tempering temperature. Tempering temperatures used were 155°C, 205°C, 255°C, and 305°C. Microstructure shows that there is a transformation zone, which is an area where phase transformation is not yet perfect. The results of this study indicate the amount of remaining austenite and the value of hardness decreases when the temper temperature is raised.