Pengaruh Shot Blasting dan Shot Peening sebelum Nitridisasi terhadap Kekerasan dan Kedalaman Lapisan Nitrida Baja H 13 Modifikasi = Effect of Shot Blasting and Shot Peening Treatment Prior to Nitriding on The Hardness and The Depth of Nitrided Layer in H 13 Steel Modification

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Abstrak

[ABSTRAK
Pada proses pembentukan logam metode die casting, nitridisasi memegang peranan penting dalam peningkatan umur pakai dies. Inovasi proses perlakuan permukaan yang dilakukan sebelum nitridisasi bertujuan untuk meningkatkan efisiensi nitridisasi dan kedalaman lapisan nitrida pada baja H13 Modifikasi.
Nitridisasi gas dilakukan dalam vacuum furnace, pada suhu 510oC selama 5 jam.Shot peening dilakukan dengan menggunakan bola baja dengan tekanan 461 kPa.
Shot blasting dilakukan sebagai metode pembersihan permukaan material menggunakan partikel SiC. Karakterisasi permukaan sampel sebelum dan sesudah variasi proses difokuskan pada perubahan struktur mikro, distribusi kekerasan mikro, dan komposisi kimia lapisan nitridisasi. Dari proses nitridisasi yang didahului shot peening, didapatkan kekerasan maksimal 1196 HV dengan kedalaman efektif lapisan difusi 72 !m. Nilai ini lebih besar dari proses nitridisasi tanpa didahului perlakuan permukaan, yang menghasilkan kekerasan maksimal 1101,4 HV dengan kedalaman efektif lapisan difusi 54!!m. Variasi proses nitridisasi dengan shot peening menghasilkan ketebalan white layer 4,1!!m; lebih tebal dari proses nitridisasi tanpa shot peening 3,7!!m. Sedangkan pada nitridisasi yang tidak didahului perlakuan permukaan tidak ditemukan adanya white layer.
ABSTRAK
In the die casting practice, nitriding represents an important factor in enhancing the service life of dies. Surface treatment innovation prior to nitriding in this research aim to increased the nitriding efficiency and the depth of nitrided layer of H13 Modification steel. The gas nitriding process was performed at temperature 510oC for 5 hours in a vacuum furnace. Shot peening was performed prior to nitriding using a cast steel ball with 461 kPa nozzle pressure. Shot blasting with SiC particle was also performed as a surface cleaning method. Characterizations on the surface of steel were done before and after the variation of nitriding process with focused on the microstructure, microhardness profile, and the chemical composition of the nitrided layer formed. It was found that shot peening prior to nitriding significantly increased the nitriding kinetics, that results in 1196 HV maximum surface hardness with 72 !m effective case depth. This results were higher than the nitriding process without prior surface preparation, which have

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While the nitrided only process did not formed a white layer, the shot peened
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