

# Pengaruh arus listrik dan perlakuan panas pada baja bake hardening hasil pengelasan titik terhadap mikrostruktur dan sifat mekanis = Effect of welding current and heat treatment on material bake hardening result of resistance spot welding to the microstructure and mechanical behavior

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## Abstrak

[Baja Bake Hardening (BH) merupakan baja baru yang mulai digunakan pada industri otomotif karena material ini menjadi solusi dari proses pembentukan panel mobil yang mudah dan keinginan hasil akhir berupa panel yang kuat. Sifat material BH ini yaitu akan menjadi lebih kuat dengan kenaikan yield strength sebesar 30-40 MPa hanya dengan mendapatkan pre-strain / regangan awal minimal 2% dan pemanasan 170°C selama 20 menit. Dalam proses pembuatan mobil, regangan awal didapat saat proses pembentukan panel mobil atau tekanan saat spot welding dan pemanasan didapat saat oven rangka mobil di proses pengecatan. Pada penelitian ini, perubahan parameter arus dan proses pemanasan di teliti dan didapatkan bahwa kekuatan spot welding akan naik setelah mendapatkan pemanasan dan arus yang optimal pada 11kA karena lebih dari itu akan turun. Serta pada arus 8kA sebelum pemanasan tidak terbentuk nugget (cold weld) namun bisa diperbaiki

kualitas nuggetnya dengan pemanasan. Hal ini tidak terjadi pada material bukan BH. Dan secara kekerasan, mulai Base Metal-HAZ-Nugget juga mengalami kenaikan setelah oven. Secara mikrostruktur, berubah mulai dari dominasi ferrite menjadi ferrite-perlite dan pada nugget terdapat bainit walaupun dalam jumlah yang kecil.;Bake Hardening Steel is a new material has been using in automotive industry because this material become solution for easy forming panel car and last product is good strength. Characteristic material will increase yield strength until 30-40MPa only by get pre strain minimum 2% and get baking on temperature 170°C at 20 minutes. In Manufacturing Cars, pre-strain get from forming process panel or pressure during spot welding process and for baking get during oven process body car on painting process. On this research, variation welding current and baking process had been studied and get result strength of spot welding will increase after get baking process and parameter optimal in current 11kA and if current more than 11kA, strength will decrease. Also for current parameter 8kA before baking nugget not occurred but can be improve after baking. For hardness, from base metal-HAZ-Nugget also increase after baking. And for microstructure, change from dominant ferrite become ferrite-perlite and on nugget small area had bainit., Bake Hardening Steel is a new material has been using in automotive industry

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