ABSTRACT

EFFECT OF HOLDING TIME VARIATION ON PACK CARBURIZING PROCESS TO HARDNESS AND THE CHEMICAL COMPOSITION OF STEEL ST41

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Steel ST41 is one kind of low carbon steel that is widely used as material components of the machine. However, low carbon steel has debility like low hardness. To increase the hardness of low carbon steel can be used pack carburizing process. The purpose of this research is to determine the effect of holding time on variation pack carburizing process to the hardness and chemical composition of the steel ST41. The pack carburizing process used 15, 30, 60 minutes variations of holding time while the temperature constant was at 900 ^{o}C. This study used charcoal coconut shell as activated carbon and egg shells as catalyst. Cooling was done by quenching in the water as cooling media. This experiment was micro vickers hardness examination and chemical composition examination. The result of the research is that the pack carburizing process can increase the hardness of steel ST41. Hardness value before being processing pack carburizing steel was 142.88 HV, the highest hardness during holding time of 60 minutes which equal to 423.7 HV. Hardness value increases with the length holding time. Chemical composition of the test results also showed that the content of the carbon steel increased after pack carburizing process. Carbon content before processing pack carburizing steel was 0,0723 (wt.%) with increased the highest carbon content during holding time of 60 minutes which equal to 0,214 (wt.%). The content of the carbon in the steel affects the hardness of steel. The larger the content of the carbon, the higher of steel hardness will be.

Keywords: steel ST41, pack carburizing, holding time, hardness, chemical composition