

ABSTRACT

EFFECT OF HEAT TREATMENT, TEMPERING TEMPERATURE VARIATIONS AND HOLDING TIME ON HARDNESS AND MICROSTRUCTURE OF MEDIUM CARBON STEEL LEAF SPRING

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Research has been done on the effect of heat treatment, tempering temperature variations and holding time on hardness and microstructure of medium carbon steel leaf spring. The main materials used in this study are leaf spring. Test data retrieval include chemical composition, hardness and microstructure with temperature austenitizing (hardening) is 835 °C with a hold time of 30 minutes, as well as variations in tempering temperature 425 °C and 625 °C with a hold time of 40 and 60 minutes. Hardness testing done with using Rockwell method. Chemical composition of the test results, showing steel leaf spring used a medium carbon steel (C = 0.57%). Highest hardness test results at a temperature of 835 °C, which is a hardening heating followed by cooling quench by 58.2 HRC, while the initial value of only 43.1 HRC hardness. Hardness values and tempering effect of holding time generally showed a decrease in hardness values, where the higher the tempering temperature and the longer the detention the hardness value will be smaller. These results are consistent with the original purpose of research is to reduce the hardness of steel after quench, because the steel is too hard will be brittle and fracture easily. Microstructure results also showed changes in the phase of ferrite and pearlite before heat treatment, to martensite after hardening heat treatment, and a tempered martensite finer and evenly after tempering heating.

Keywords: heat treatment, steel leaf spring, Rockwell method, hardness, tempering, hold time, microstructure.