THE EFFECT OF HOLDING TIME
ON THE MECHANICAL PROPERTIES
OF AUSTEMPERED DUCTILE IRON

by

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ABSTRACT

Some factories in Indonesia plan to produce Austempered Ductile Iron (ADI), because this material offers some advantages over other cast irons, such as having excellent fatigue properties and also being cheaper than steel. This thesis describes some experiments done to study the effect of some variants in the austempering process on mechanical properties, especially fatigue of ADI. In particular the effect of holding time on fatigue properties of ADI were studied, and an attempt was made to answer the question "Can the stress concentration factor theory proposed by Kubicki be applied to ductile cast iron and ADI?". This stress concentration model enables quantification of the influence of both matrix yield strength and size of inclusions on the endurance limit of inhomogeneous material. Initially some laboratory experiments were done such as tensile tests, hardness tests and fatigue tests. The tensile and hardness data are plotted on a histogram diagram while the fatigue results are plotted on an S-N curve. The results of the calculations were compared with the fatigue test results. The conclusions are:

Increasing holding time can decrease the mechanical properties of ADI;
Comparing Kubicki's theoretical result with the fatigue test result shows quite strong agreement.
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DECLARATION

I certify that this thesis does not incorporate, without acknowledgment, any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief, it does not contain any material previously published or written by another person where due reference is not made in the text.

[Signature]

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Dody Prayitno
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