



International Journal on Recent Researches In Science, Engineering & Technology

(Division of Mechanical Engineering)

A Journal Established in early 2000 as National journal and upgraded to International journal in 2013 and is in existence for the last 10 years. It is run by Retired Professors from NIT, Trichy.

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Research Paper

Available online at: www.jrrset.com

ISSN (Print) : 2347-6729

ISSN (Online) : 2348-3105

Volume 5, Issue 4,
April 2017

JIR IF : 2.54

DIIF IF : 1.46

SJIF IF : 1.329

Evaluation of the hardening properties of plain carbon steels and ductile cast iron using neem oil as quenchant

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Abstract

The authors worked on evaluating the hardening properties of plain carbon steels and ductile cast iron using neem oil as quenchant. They considered the samples and quenched to room temperature in neem oil. For comparison purpose the samples were also quenched in SAE engine oil. The microstructure and mechanical properties of the quenched samples were used to determine the quench severity of the neem oil. They observed that the hardness value of medium carbon steel was increased from 18.30HVN to 21.60 and 20.30 and 20.70HVN, further the corresponding values for ductile cast iron were 18.90HVN to 22.65, 20.30 and 21.30HVN for cast iron samples, for water neem oil SAE40 respectively. The microstructural samples quenched in neem oil revealed the formation of martensite structure. Hence they concluded that neem oil can be used where cooling severity is less than that of water and greater than SAE40.