

(NSSC)

(CMP) -

(CMP) -

CSF

(CMP) -

(NSSC)

(NSSC)

CSF

(CMP)

(NSSC)

(NSSC)

CMP

(NSSC)

(NSSC)

(E-mail: zihoss@yahoo.com)

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(Mohlin, U.B.1997)

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( KWh/t)

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*(Kocurek, M.J.1983)*

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(CMP)

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(NSSC)

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CSF

(CMP)

CSF

(NSSC)

(NSSC)

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(LD)

(FD)

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(CMP)

(T)

$$\begin{aligned}
 &= \bar{X}_{pr} && t \\
 &= \bar{X}_{re} \\
 &= S^2 \\
 &= n_{pr} \\
 &= n_{re}
 \end{aligned}
 \quad
 t = \frac{|\bar{X}_{pr} - \bar{X}_{re}|}{\sqrt{\frac{S^2(n_{pr} + n_{re})}{(n_{pr})(n_{re})}}}$$

$t_t$	T	$t_s$	T	S	$SS_{re}$	$SS_{pr}$
/		/ *		/	/	/

\*

t

$t_t$	T	$t_s$	T	S	$SS_{re}$	$SS_{pr}$
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t

t <sub>t</sub>	T	t <sub>s</sub>	T	S	SS <sub>re</sub>	SS <sub>pr</sub>
/		/ *		/	/	/

t

t <sub>t</sub>	T	t <sub>s</sub>	T	S	SS <sub>re</sub>	SS <sub>pr</sub>
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## An Investigation of Impact of Pulping Methods on Fiber Refining Quality

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E. Afrabandpei<sup>2</sup>

### Abstract

Wood needed in pulping, using chemiomechanical (CMP) and Semichemical Neutral Sulfite Process (NSSC) in Mazanderan Wood and Paper Industries Company is partly provided from forest areas in Sari region. Hornbeam and beech are two main wood species used in a proportion of 75 to 25 by volume in the factory.

Double disc refiner with two feeding inlets and one outelt is used for refining, but one refiner disk is perpetually engaged with refining in the process line, for each of the above mentioned pulping processes. The unrefined pulp consistency was 3.5 to 4 percent for both processes, meanwhile pulp yield for CMP and NSSC were obtained as 85 and 75 percent respectively. Freeness of unrefined CMP and NSSC pulp were 400 and 450 CSF as well as for refined CMP and NSSC pulp being 350 and 400 respectively. Fiber diameter, lumen, and wall thickness in CMP refined pulp fibers decreased to 11, 1.5 and 19.5 percent with comparison to the unrefined pulp respectively. Fiber diameter, lumen and wall thickness in NSSC refined pulp fiber also decreased to 14.5, 3 and 24 percent as compared with the unrefined pulp respectively.

Microscopic observation in CMP and NSSC refined pulp fiber showed much broken vessel and fibers with less fiber fibrillation in former and less broken fiber with better external fibrillation as well as reduction of fiber wall thickness in latter. Therefore much fiber flattening has taken place in NSSC pulp after refining. Despite more freeness rate in NSSC pulp, fibers in this pulp have had better flexibility after refining.

In the same conditions of refining, pulping method has effectively affected refining quality. Observation showed that, better fiber flattening and refining quality belonged to NSSC pulp, so strength of paper made from NSSC pulp will rank higher by comparison.

**Keywords:** Disc refiner, Chemiomechanical, Neutral sulfite, Freeness rate, Fiber diameter, Fiber thickness, Paper.

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