

---

NSSC  
NSSC

\*

( / / : / / : )

/ NSSC

(CSF)

NSSC

gr/m<sup>2</sup>

PFI

NSSC

NSSC

NSSC

NSSC

:



... NSSC

---

NSSC

NSSC

( )

C )

(

/ /

(CSF)

( )

*Helianthus annuus*

*.Compositae*

( )

)

(

/ / / /

ml

( )

NSSC

(CSF)

NSSC

NSSC

NSSC

NSSC

---

- Canadian Standard Freeness

- Grammage

- Linear

---

- Neutral Sulfite Semichemical

---

( )

Kgr/cm

°C

HATTO

NSSC

" ( )

( / )

NSSC

NSSC

( )

gr/m<sup>2</sup>

( )

gr/m<sup>2</sup>

(RCT)

(CMT)

---

- Shive  
- Handsheets

---

- Eroglu  
- Jimenez  
- Marechal

...

NSSC

---

NSSC		NSSC	
ml, CSF	NSSC ml, CSF	NSSC ml, CSF	NSSC ml, CSF

NSSC

.(CSF)

TAPPI

T240- T236-cm-85  
T227-om-92 om-88  
T205-om- T248-cm-85  
T410-os-88 T410-om-88 88  
T547-pm-88  
T220-om-88  
T404-cm-92  
T808-om- T809-om-87  
T403-om-91 87

P<sub>11</sub>:73

SCAN

---

( )	(Na <sub>2</sub> O %)	( )	(Na <sub>2</sub> O %)
/	/		
/	/		
/	/		
/	/		

gr/m<sup>2</sup>  
 NSSC  
 gr/m<sup>2</sup>

(CMT)

(RCT)

/

(CSF)

/

PFI

gr/m<sup>2</sup>

NSSC

NSSC

NSSC (CSF)	NSSC (CSF)	NSSC (CSF)	
/ ns <sup>2</sup>	/ <sup>1</sup> **	/	(gr/cm <sup>3</sup> )
/ **	/ **	/	( )
ns	**		(Nm/gr)
/ ns	/ **	/	(Km)
**	ns		(KN/m)
ns	**		(N)
/ **	/ **	/	(KN/m)
/ **	/ **	/	(mN.m <sup>2</sup> /gr)
/ **	/ **	/	(KPa.m <sup>2</sup> /gr)





---

NSSC

NSSC

°C

/

/

NSSC

/

NSSC

/

NSSC

NSSC

NSSC

( / )

NSSC

NSSC

- Hand feeling

- Reject

---

( )

)

(

( )

( )

*(Pinus brutia)*

*(Picea excelsa)*

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## The effects of using sunflower stalk NSSC pulp on the properties of fluting paper from hardwood NSSC pulp

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### Abstract

By carrying various cooking from sunflower stack chips using NSSC pulping process, optimum cooking at pulp yield of 43.8 % and kappa number of 82.6 was selected under cooking condition of 20 % chemical charge based on sodium oxide, cooking time of 180 min, and maximum temperature of 170 degree Celsius. The pulps were refined to obtain freeness levels of 328 ad 372 ml, CSF, by PFI mill revolutions of 150 and 500, respectively. Standard hand sheets with grammage of 127 g/m<sup>2</sup> were made from both sunflower NSSC pulps, at three levels of 10, 20 and 30 % in admixture with hardwood NSSC pulp from Mazandaran Wood and Paper Industries (MWPI), and their physical and strength properties were measured. Statistical analysis showed that, up to 30 % of sunflower NSSC pulp with freeness of 328 ml, CSF can be blended with hardwood NSSC pulp from MWPI, to make fluting paper. It has been also shown that, up to 30 % of hardwood NSSC pulp from MWPI can be substituted by sunflower NSSC pulp at freeness level of 372 ml, CSF, if 5 % unbleached softwood kraft pulp can be used in the furnish.

**Keywords:** Sunflower stalk, NSSC pulp, Fluting paper, CMT, RCT