

PRELIMINARY STUDIES ON THE MANUFACTURE OF TOILET
TISSUE PAPER FROM KRAFT ALBIZZIA MOLUCCANA PULP

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ABSTRACT

Investigation on the manufacture of toilet tissue paper from kraft Albizzia moluccana pulp indicates that good quality paper can be prepared from a mixture of 80 percent kraft Albizzia moluccana and 20 percent sulphite (Canadian) pulps. The paper made in the laboratory shows good softness and easy disintegration under the action of flush water.

INTRODUCTION

Paper of high degree of softness and absorbency, appreciable strength, particularly the burst and tear, and above all, easy disintegration under the action of flush water is termed as toilet tissue paper (1).

Toilet tissue paper is usually made from the sulphite pulp (1). The present investigation is carried out to see whether kraft pulp can be used for the purpose.

Excellent burst factor of different types of papers made from kraft Albizzia moluccana pulp even at high freeness (2) indicated the possibility of making toilet tissue paper from the pulp under investigation.

In a previous study (3) the optimum pulping conditions for Albizzia moluccana wood were determined as follows:-

1. Process	Kraft
2. Total chemical	15.06%
3. Sulphidity	17.24%
4. Total cooking time	3 hours
5. Temperature	170°C
6. Liquor to wood ratio	4 : 1

The pulps obtained at the above conditions, after beating and proper addition of colour, were run in the paper machine. The paper was then tested for determining relevant physical properties.

EXPERIMENTAL

Kraft pulps were prepared at the optimum conditions stated above. The pulps were beaten for five minutes so that the freeness remained between 550 and 600 ml. (CSF). Colour was then added to the paper-making stock. The stock was passed through the laboratory model Fourdrinier paper machine. The wet sheet after screening was run through the creping section and finally dried and rolled. Two machine runs were conducted. One of the runs was done with 100 percent kraft *Albizzia moluccana* pulp and the other with a mixture of 80 percent kraft *Albizzia moluccana* and 20 percent sulphite (Canadian) pulps. The papers made were conditioned in conditioning room kept at $72 \pm 1^{\circ}\text{F}$ and 50 ± 1 percent relative humidity for 24 hours and then tested for density, burst factor, tear factor, water absorbency and time for disintegration.

RESULTS AND DISCUSSION

The conditions of stock preparation for toilet tissue paper making are given in Table 1.

Table 1. Stock preparation of paper-machine run

Machine Run No.	pulp used		Final freeness (CSF) ml	Stock consistency	Sizing	Colour (Congored) percent
	kind	percent				
69	kraft <i>Albizzia moluccana</i>	100	570	0.34	nil	0.17
70	a) kraft <i>Albizzia moluccana</i>	80	550	0.34	nil	0.17
	b) sulphite (Canadian)	20				

Table 2 shows that water absorbency and time for disintegration of the paper obtained in Run No. 69, where 100 percent kraft Albizzia moluccana pulp was used, were too high (90 and 50 seconds respectively). The paper also did not attain the desired degree of softness and its thickness.

Table 1. Physical properties of toilet tissue paper obtained from kraft albizzia moluccana pulp

Machine Run No.	Ream wt ^a lb	Thickness cm	Density g/cc	Burst factor	Tear factor		water absorbency see	Time for disintegration see
					M.D. ^b	C.D. ^c		
69	65	-	-	-	-	-	90	50
70	51	0.025	0.33	8.0	25.0	44.0	43	20

^a 500 sheets of 24 in x 36 in size

^b Machine direction

^c Cross direction

could not be made thin enough to have the weight of one ream (500 sheets of 24 in x 36 in size) below 65 pounds. It is clear from the above that 100 percent kraft Albizzia moluccana pulp is unsuitable for making toilet tissue paper. As such no further tests were carried out on it.

It was decided at this stage to mix some imported sulphite pulp with the Albizzia moluccana pulp to determine whether tissue paper can, at all, be made with the pulp under investigation. Run No. 70 was carried out with a mixture of 80 percent kraft Albizzia moluccana pulp and 20 percent sulphite pulp. The paper obtained with this stock condition showed more than double the water absorbency and required 60 percent less time for disintegration compared to the paper made from 100 percent kraft pulp. It also indicated appreciable burst and tear factors. The ream weight was 51 pounds, the density 0.33 and the thickness, 0.025 cm. It may be noted that the paper made was rather thick and heavy. Further work is necessary towards lowering the thickness and density. The formation and handling of the paper indicated that paper made was sufficiently soft.

CONCLUSIONS

Kraft Albizzia moluccana pulp with an admixture of 20 percent sulphite (Canadian) pulp can be utilized for the manufacture of toilet tissue paper. The physical properties of this paper are quite satisfactory. Normally 100 percent sulphite pulps are used for the manufacture of tissue paper. The investigation showed that substantial amount, even as high as 80 percent kraft pulp, can be used for making good quality toilet tissue paper.

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