A Comparative Study of Newsprint Manufactured From Virgin Vs Recycled Fibre.

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ABSTRAT

There is a myth that the Newsprint manufactured from recycled fibre is inferior to the Newsprint manufactured from virgin fibre. The misconception gained momentum due to various short comings like lower brightness, lower stiffness, lower strength, lower smoothness, lower gloss, generation of dust, inferior runnability, poor ink absorption, easy picking etc. However technology available today make it possible to produce recycled newsprint which is comparable to virigin sheet (1). A comparative study of both the Newsprint for various physical and optical properties are highlighted in this study and it is proved that Newsprint manufactured by recycled fibre is comparable with the Newsprint manufactured by virgin fibre.

INTRODUCTION

Newspaper is an effective tool for communication. The first Newspaper was printed and distributed in Newyork in the year 1690. The Rittenhouse family established the first paper mill manufacturing hand made paper in German House, Peennysylvania. The mill pioneered recycling in North America by using rags and straw as raw material. Paper was made from Straw, Rags and Grasses until 1850's. It was then discovered that the wood chips cooked in certain chemicals could be broken down to produce fibre (2). Wood is the major source of fibre. The Paper Industry world wide has been challenged by the growing demand for virgin fibre which result in the depletion of forest resources leading to ecological and environmental imbalance.The industry course of direction changed towards utilisation of recyled fibre.

The estimated World Newsprint production for the year 1998 is 40 million tons (3) and it is estimated that by the year 2000 the recycled fibre usage would be around 6 million tons in Europe only (4). In India during the year 1997 the Newsprint consumption was 8.97 lakh tons and production was 3.5 lakh tons. The supply and demand gap of 5.47 lakh tons was met by imports from different countries. It is estimated that the waste recovery was around 6.5 lakh tons (5). At present the major producer of Newsprint is from Public Sector Industry based on virgin fibre. M/s. Rama Newsprint and Papers Ltd. is a pioneer in manufacturing Newsprint using 100% recycled fiber like ONP & OMG.

ONP generally consists of high content of mechanical fibre (70%) and chemical fibre (30%)

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which includes filler. starch, dyes etc. In general the Ink constitute 1-2% of the ONP furnish (6). The process parameters can be changed according to the final requirement of the product.

To provide modern press room with high quality Newsprint which is today market demand, the Newsprint should have the following qualities;

a) The paper should have sufficient strength to ensure good runnability in press.

b) Good print quality which means low print through, high print density and print smoothness.

c) Even paper density and good formation.

d) Strong surface to minimise linting and dusting.

e) Good dimentional stability

f) High 'Z' Directional strength to avoid blistering & delamination.

g) High brightness and high opacity.

The various Newsprint samples were collected from different printing presses. The test results are from In-house evaluation by following Tappi Test methods and DIN standard. A typical evaluation of physical and optical properties are given in Annexure -I.

RESULTS AND DISCUSSION

A comparative evaluation of Newsprint samples reveal the following points.

1) The grammage of all the newsprint are within 48-50 GSM except Russian and one indigenous Newsprint.

2) The loading materials have not been added in Canadian, Russian, Newsprints, where as in indigenous Newsprint loading was upto 3-5%. Incase of German recycled Newsprint the loading was around 12%.

3) The Breaking length in MD of all Newsprint samples are around 4000 meters. The higher breaking length indicates better rennability on the paper machine as well as in printing press.

4) Tear factor of RNPL Newsprint is comparable with all Indian virgin Newsprints.

5) Bending resistance of RNPL Newsprint is better than Russian and most of the Indian Newsprints.

6) The Bendtsen smoothness values for Imported virgin Newsprint and one Indigenous Newsprint are low and RNPH Newsprint smoothness values are second lowest among Indigenous Newsprints. Low smoothness values related to good formation of sheet and good print quality.

7) The porosity values of RNPH Newsprint are comparable with Imported Newsprint like Canadian and better than some of the Indigenous newsprints. The lower porosity indicates less requirement of ink.

8) Brightness values of all Newsprint samples are in the range of 55 -59% ISO excepting one Indian virgin Newsprint (around 52% ISO).

9) RNPL Newsprint has high opacity compared with all indigenous as well as imported Newsprints. Higher the opacity results in less see through.

10) The scattering coefficient of RNPL Newsprint is better than virgin Newsprints. The absorption coefficient of RNPL Newsprint is comparable with imported Newsprint and some indigenous Newsprints.

11) The dominant wavelength values of all Newsprint are within the range of 575±7 nm.

12) The excitation purity of all Newsprint are within the range of 5 to 7.5% except Canadian (11%) and one Indian (9%)

As per the 1991 survey by the Journal 'Editor and Publisher' about recycled Newsprint v/s Virgin Newsprint in North America the printers opinion was 18% says no difference, 33% says virgin Newsprint better and 49% says recycled Newsprint better.

CONCLUSION

From the above data it is concluded that the newsprint manufactured by RNPL with 100% ONP & OMG having advantage like high opacity and scattering coefficient over the virgin Newsprint and

ANNEXURE-1

PROPERTIES OF NEWSPRINT

Sl.	Particulars		Unit	ISI Norms No.11.688/86	Indigenous Virgin				Imported Virgin		Recycled		
					A	B	C	D	Canada	Russia	RNPL	Germany	USA
01	Substance		g/m^2	48-52	48.0	51.0	46.0	49.2	48.9	45.9	49.0	48.6	49.4
02	Moisture		%	-	7.8	7.4	6.8	6.5	6.7	6.0	7.2	6.5	6.5
03	Ash		%	-	3.8	1.0	3.9	6.4	1.5	0.8	4.3	11.6	5.0
04	Thickness		microns	80±4%	72	73	88	67	76	74	76	71	80
05	Bulk		cc/gm.	--	1.5	1.43	1.91	1.36	1.62	1.61	1.55	1.46	1.62
06	Breaking Length	MD	meter	min. 3000	4230	4010	4050	6560	4760	4105	4280	5600	4310
		CD			1950	1850	1755	1970	1860	1760	1780	1545	1680
07	Strech	MD	%	--	1.1	0.9	1.1	1.6	1.0	0.8	1.4	1.1	1.0
		CD		--	1.8	2.1	1.8	2.2	2.3	2.0	2.3	2.4	1.7
08	Tear Factor	MD	--	--	44	36	39	35	48	43	44	48	42
		CD		min. 45	63	53	54	53	63	71	56	77	65
09	Burst Index		$kPa.m^2/g$	--	1.64	1.35	1.28	2.2	1.5	1.2	1.5	1.56	1.3
10	Bending Resistance	MD	mNm	--	105	95	108	113	136	108	105	102	123
		CD		--	75	38	45	53	49	36	53	56	45
11	Smoothness	Side I	ml/min.	--	265	155	255	100	100	80	150	185	120
	(Bandtsen)	Side II		max. 300	415	210	270	120	110	110	165	310	140
12	Porosity (Bendtsen)		ml/min.	max. 800	120	445	640	540	490	340	410	200	490
13	Lint Count		$nos./cm^2$	--	27	24	26	18	18	20	24	28	20
14	Brightness ISO		%	min. 49	55.8	51.2	55.5	57.2	55.8	58.2	55.1	57.3	56.9
15	Opacity ISO		%	90 min.	91.5	95.5	91.7	93.9	94.8	94.9	95.3	95.0	94.2
16	Yellowness		%	--	10.8	11.6	8.9	6.9	10.5	6.0	8.2	9.6	7.9
17	L*		%	--	81	77.8	80.1	78.9	81.0	82.2	80.5	83.1	82.5
18	a*		%	--	0.5	0.00	-0.16	1.05	1.43	0.25	-0.07	-0.01	-0.9
19	b*		%	--	8.0	4.06	6.3	3.57	9.7	5.8	3.9	6.3	5.2
20	Scattering Coefficient		$m^2/Kg.$	--	38.6	41.4	45.3	40.6	50.7	54.1	49.6	52.7	51.4
21	Absorption Coefficient		$m^2/Kg.$	--	5.7	8.61	7.44	7.6	7.4	6.9	7.6	5.9	7.1
22	Dominant Wavelength		nm	--	578	577	577	582	580	578	577	577	575
23	Excitation Purity		%	--	9.2	4.14	7.1	4.35	11.3	6.6	4.4	7.0	5.7

other strength and optical properties are comparable. It is evident from the market feed back that the Newsprint made from recycled fiber manufactured by RNPL is widely accepted tending Above all it Eco-Friendly process and Global is ing towards Eco-Friendly Technology.

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