

Molding of Recovered Paper into World Class Paperboards

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Recovered fiber occupies an important role in the World of Paper and Paperboard production. Reclamation of recovered fiber and its re-use has a positive benefit to the environment with regards to solid waste disposal and proportionate reduction in utilization of forest based raw material and agro residues. Use of recovered fiber requires less energy and water. ITC PSPD is one of the largest consumers of recovered fiber with three board machines producing quality coated paperboards. Recovered fiber treatment plant is the biggest in the country, having processing capacity of more than 900 BDMT/day with the latest Technology of DCS. This paper depicts the salient features of the recovered fiber recycling and processing experience at ITC PSPD, Unit: Bhadrachalam.

INTRODUCTION

Indian Paper Industry is marching ahead to keep pace with the International competition. Recovered fiber occupies an important slot in this development. Share of paper production in India, based on recycled fiber is about one third, which amounts to approximately 12 lakhs tonnes per annum. Globally use of recycled fiber is also on the rise. It is more than 50% of the world paper and paperboard production of 300 million tonnes. Reclamation and re-use of recovered fiber has a positive benefit to the environment with regards solid waste disposal. In India, in view of the depletion of forest resources and inherent pollution problem with agro residue at the scale of operation and favored by lesser energy and water consumption, usage of recycled fiber has been increasing. The size of recycled fiber based mills varies from 10 tonnes to 900 tonnes per day, producing a variety of paper and paperboards. Currently, Indian Paper Industry utilises 36% of recycled recovered fiber which is expected to a level of 44% by 2015. Due to low recovery rate of indigenous recovered fiber, 70% of the recovered fiber requirement is met through imports mostly from USA, Europe, Singapore, Middle East etc. With increased use of imported

recovered fiber, lot of contaminants like wet strength resins, hot melt additives, pressure sensitive additives, toner inks etc, are entering into the processing streams affecting the finished product quality and productivity adversely. Recovered fiber cycle is show in Fig:1.

FOLDING PAPERBOARD BOX

Folding paperboard products traditionally fall into three categories.

- Recycled Paperboard
- Solid bleached sulphate(SBS) board
- Unbleached kraft Paperboard

In recent years, clay coated recycled paperboard has enjoyed the highest growth of all the paperboard grades. These products have benefited from not only the recycling but also the technical advantage in the process and material science that has enabled them to compete favorably with the traditional virgin folding paperboard markets.

The common folding paperboard today is a thin multi layered product often with Virgin fiber in the top layer and mechanical pulp and recycled fiber in the middle and back layers. Pigment coating is usually applied to out side layers to enhance appearance and create an attractive printing surface. The most sophisticated coated paperboard can have up to five different coatings applied on paperboard machine to top and back of the sheet. These products have been developed for attractively styled cartons with visually appealing colours and graphics which find applications in high value end-use segments.

SBS is the premium bleached virgin grade used to produce folding paperboard boxes for end use applications where recovered fiber paperboards are

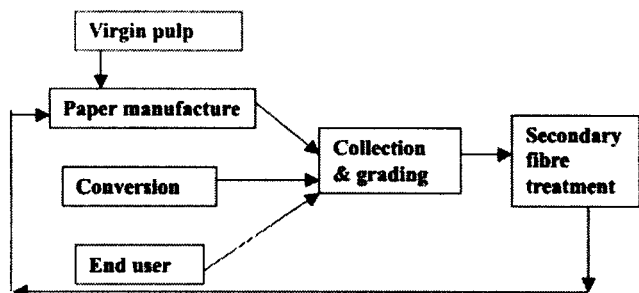


Figure : 1 Recovered Fiber Cycle

Table 1

Imported Recovered Fiber	End use
A) Mixed waste	Grey
B) Old news print	Board
C) Box Board cuttings (B.B.C.)	
A) New double liner Kraft cuttings (NDLKC)	Deluxe Kraft
B) Old corrugated container (O.C.C.)	

impracticable or unsuitable.

Unbleached kraft folding box board has in recent years gaining its manufacture potential like SBS boards, it has limited end use.

The folding box board industry sees strong competition from plastic packaging alternatives. In recent years concern for the conservation of natural resources, the plastics, in the absence of bio-degradability and limited recycling potential, is assisting to reverse substitution trends of paperboard.

QUALITY PARAMETERS

As process technology and distribution demands develop the traditional product quality parameters that predict fitness of paperboard products to meet conversion and end use performance requirements are being challenged. New quality measurements and product test procedures in terms of efficiency, speed, accuracy, relevance and continuity must accompany these developments.

USE OF RECOVERED FIBER AT ITC PSPD

Recovered fiber recycling and fiber processing is very much dependent on the end use of the product in which recovered fibers are used. At ITC PSPD, recycling of Recovered fiber pulp started in the year 1980 for the manufacture of duplex board on PM-1. Two streets, Street 'A' and Street 'B' were installed with flexibility to supply recovered fiber pulp /sorted white ledger for paper machines. In the year 1995 Street 'A' was upgraded with screening, cleaning and hot dispersion.

Considering the demand for quality coated boards was on the rise, a new machine PM-4 was installed and commissioned with an annual capacity of 1,20,000 Tones/annum and PM/C 5 was added with 100,000 Tones/annum. To cope up new machine production, Recovered fiber treatment plants of 300 BDMT/day and 350 BDMT/day were installed and successfully commissioned with the latest Technology of DCS.

Since the availability of recovered fiber from indigenous sources is limited, major quantity of Recovered fiber is being imported from Europe/ United States. Different categories of recovered fiber and its end uses are shown in Table-1. To some extent the indigenous recovered fiber is also used. The type and its end uses is shown in

Table 2

Indigenous Recovered Fiber	End use
i) Duplex	Grey
ii) O.N.P. (Ind.)	Back
iii) Office record	Board

Table-2.

SECONDARY FIBRE TREATMENT PLANT AT ITC PSPD:

Secondary fiber treatment plant of ITC PSPD consists of four streets. Plant capacities and processing equipments are shown in Table-3.

A unique problem faced in recycling recovered fiber is that of physical contaminants. The removal of these contaminants is essential to produce a reusable fiber. Quality of final product like visual appearance, run ability and strength is improved by contaminant removal. Contaminants interfere with the bonding between the fibers reducing the strength of resultant paper/board. The presence of minor concentration of contaminant can cause a high nuisance value. Small flakes of metal foil can trigger off metal detectors and cause rejects in packaging lines.

Hence ITC PSPD adopted the best Technology available in the world for recycling recovered fiber to produce more and cleaner pulp. Line diagram for Street 'C' is also shown in Fig-2 . Total system and design engineering was done by M/S Jaakko Poyre, a world class consultant. All processing equipment are imported and supplied by the following renowned suppliers.

Pulper & screening	M/S Lamort, France
Centricleaning and thickening	M/S Celleco, Sweden
Hot dispersion	M/SCellwood, Sweden
DCS system	ABB Bangalore

SALIENT FEATURES OF THE PLANT

High density Batch pulper	operating in Auto cycle Operating Cy. 15-18 %
Three stage Coarse screening 2.0 MM hole perforation	Operating at 3-3.5 % Cy
Three stage fine screening 0.20 mm slot	Operating at 2.5-3 % Cy
Four stages centricleaning System with fiber miser CDI Disc Filter	Operating at low pressure drop 150 Kpa. Stock inlet Cy 0.8-0.9 % Stock outlet Cy 12-14 %
Hot dispersion	Dispersion Temp. 120 C Disc gap 0.2 mm
DCS system	Better process control Reduced manpower

