REVIEWING USE OF VIRGIN PULP PAPER AND RECYCLED PAPER WITH RESPECT TO TEXTBOOKS FOR STUDENTS

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Abstract - This paper discusses the use of virgin paper and recycled paper for text books for students. Studies demonstrate the harmful effect of recycled paper with special reference to students whereas virgin paper is ecofriendly. Study clearly portrays the pros and cons of the use of virgin paper and recycled paper, which depicts that the virgin paper is eco-friendly and is more suitable for textbooks than recycled paper.

Keywords: recycled paper, virgin paper, eco-friendly, textbooks, durability, pollution pulp

INTRODUCTION

Pulp Mills (Virgin)

Process of making a virgin paper is quite complicated and involves several steps which include pulping, bleaching, calendaring etc

Pulping is of two types, mechanical and chemical pulping

To start with Pulp Mills make pulp, which is a mixture of cellulose fibers . Water is used as the basis of all paper products. Pulp is made in several ways depending on the type of paper being produced. Wood chips, which come from logs or from residues from sawmills, furniture manufacturers and other sources, can be chemically or mechanically separated into individual wood fibers in a process called pulping.

In chemical pulping, wood chips are “cooked” in a digester at an elevated pressure with an appropriate solution of chemicals to dissolve the lignin (the “glue” that binds the fibers in the wood) and allow the cellulose fiber bundles in the wood to separate into individual cellulose fibers. Since chemical processing is gentle on the cellulose fiber, chemical pulps tend to have longer fibers and make strong paper such as printing and writing papers and paperboard.

In mechanical pulping, chemicals are not used to remove the lignin in the wood chips. Instead, wood chips are pressed against a grinder that physically separates the fibers. Mechanical pulps have shorter fiber lengths and produce papers which do not require as much strength, such as newsprint. After the fibers have been separated, the mill washes and decontaminates the pulp. To produce a white paper product, the mill must bleach the pulp to remove color associated with remaining residual lignin. Typically, the bleaching chemicals (such as chlorine dioxide, oxygen, or hydrogen peroxide) are injected into the pulp and the resulting mixture is washed with water.

The bleached or unbleached wood pulp, which at this point is very dilute slurry, is pumped out of a head-box onto a wire screen felt that allows water to drain out of the pulp and help the fibers interlock into a sheet. By varying the amount of pulp pumped onto the wire, the speed of the wire different qualities and properties of paper can be achieved. The continuous sheet then pass through a long series of rollers that press out any remaining moisture, followed by steam-heated drums that dry the paper. Finally, a process called calendaring polishes the sheets and smoothes out wrinkles. The continuous sheet of paper is wound onto jumbo rolls and then cut to a variety of paper widths.

Recycled Paper Processing Mills

Recycled paper processing mills use paper as their feedstock. The recovered paper is combined with water in a large vessel called a pulper that acts like a blender to separate fibers in the paper sheets from each other. The resultant slurry then passes through screens and other separation processes to remove contaminants such as ink, clays, dirt, plastic and

metals. The amounts of contaminants that are acceptable in the pulp depend upon the type of paper being produced. Mechanical separation equipment includes coarse and fine screens, centrifugal cleaners, and dispersion or kneading units that break apart ink particles. De-inking processes use special systems aided by soaps or surfactants to wash or float ink and other particles away from the fiber.

Recovered fiber can be used to produce new paper products made entirely of recovered fiber (i.e. 100 percent recycled content) or from a blend of recovered and virgin fiber. Fiber cannot, however, be recycled endlessly. It is generally accepted that a fiber can be used five to seven times before it becomes too short (as a result of re-pulping and other handling) to be useable in new paper products. Recovered paper with long cellulose fibers (such as office paper) has the greatest flexibility for recycling as it can be used to produce new paper products that use either long or short fibers. Recovered paper with short cellulose fibers (such as newspaper) can only be recycled into other products that use short cellulose fibers. For this reason, recovered paper with long fibers is generally of higher value than recovered paper with short fiber.

Virgin Paper vs. Recycled Paper

Problems with recycled paper products [1]:

- Faded print
- Labels and tape not sticking
- Warping
- Porosity with suction cups
- Complete package failure in high humid environments.

Paper fibers can be reused from four to nine times depending on the paper grade. You can never know how much time paper has been reused.

Bamboo and sugarcane are virgin fibers so they don't require heavy bleaching of inks and dyes as in recycled paper products. For best results virgin paper is recommended because:

- Way more durable
- Better Resistant to humidity
- More Strength
- Longer lasting

Manufacturing of Recycle Paper Involves De-Inking which is not good for Environment for following reasons [2]:

- The paper recycling process requires the removal of inks from the used paper. Recycling facilities use different processes and the chemicals they employ range from detergents to caustic chemicals, such as chlorine.

- Print from copy machines and laser printers are particularly problematic because it is not really ink but rather a plastic polymer that the printer or copier burns onto the paper. Removal requires chemicals that are much more caustic than standard de-inking chemicals. Similarly, printing inks contain heavy metals and other compounds that require strong solvents which harm the environment & also the living beings.

- De-inking sludge is generated due to chemical addition in the board and printing press paper to the CETP (Common Effluent Treatment Plant) for landfilling. But in future there is no land available for land filling if we do not find technological option for reuse, recycle or reduction etc.

Harmful Effects of Recycled Paper

- Anthony Bernheim, a prominent San Francisco architect who supports green design principles, partly blames the careless

use of recycled materials in product manufacturing. "For example, where recycled paper is used, there is the potential to introduce formaldehyde emissions. More care needs to be exercised before resource-efficient materials are used just because of their recycled content."[3]

- Exposure to formaldehyde gas, used as a paper coating and pressed-wood adhesive (as well as in many other common products) can result in severe allergic reactions or even cancer among environmentally sensitive individuals.[4][5]

- From an environmental perspective, papers with high recycled content are obviously the way to go. Unfortunately, these types of paper generally contain BPA, which is widely used in the paper made for the thermal printers that produce sales receipts (which are then recycled and turned into other paper). The ink in newspaper (which is often recycled) is another source of BPA.[6]

- BPA, as you probably know, is an endocrine disruptor. Animal studies link it to cancer and early puberty, and at least one epidemiological study shows that adults with higher levels of BPA in their urine have increased rates of various metabolic disorders (including diabetes and cardiovascular disease). It's impossible to know, of course, what the actual health implications are of rubbing toilet paper with traces of BPA on our nether parts. But it seems reasonable to avoid this exposure to the degree we are able.[6]

- When recycling facilities remove inks from paper, the waste makes its way into the water stream. Metals from printing inks, including copper, lead, zinc, chromium and cadmium, enter the water stream. Waste water from paper recycling often contains dioxins as well, though experts are unable to determine their precise origin.[7]

CONCLUSION

Since, recycled paper is harmful for the environment and users, it is advisable that at least for students books made of virgin paper are provided and students' health is secured to be insured.

Virgin paper is Eco-Friendly (Environment Friendly) as along with fibres, paper might contain a variety of inorganic and organic constituents. Paper might contain up to 10,000 different chemicals, which can potentially contaminate the newly manufactured paper products.[8] As an example, bisphenol A (a chemical commonly found in thermal paper) has been verified as contaminant in a variety of paper products resulting from paper recycling.[9]

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