

WATER – MEETING PAPER'S NEED

Life cannot exist without water, so also Paper cannot be made without water.

WATER SECURITY

Water security in its simplest terms, is about sustainable water use. The most important fields for achieving optimum water management are :

- A structured approach towards water management in general
- Measurement & benchmarking water usage
- Minimizing fresh water use
- Optimising water circuit layout
- Appropriate effluent treatment
- Integration of advanced water treatment as an option to reduce further loading of process water

WATER AND PAPER

The paper industry is considered as one of the most water consumptive industries. It is only second to the chemical material industry, and takes 14.54% of the total water consumption for all industries.

With an estimated more than 15,000 gallons of water used for every ton of pulp produced, the pulp and paper sector remains the largest user of industrial process water in the U.S. and the second largest in Europe.

It is also one of the largest producers of wastewater. About 85 percent of the water consumed in the pulp and paper industry is used only for processing, thus, leading to the generation of large volumes of contaminated wastewater.

Therefore, water conservation has gained significant importance for this industry as treatment of contaminated wastewater has always been an expensive & technically challenging subject.

Process water makes for about 75 – 85 % and cleaning shower water around 10- 15% of total consumption in a paper mill. The balance is used as de-ionized water, cooling water and tap water. Hence reducing the consumption of process and cleaning shower water and then increasing the use of recycled water become clear priorities.

WHAT IS BEING DONE

Even though the pulp and paper industry is still highly dependent on fresh water, there have been some remarkable

achievements with regard to the water-use patterns.

For instance:

- Europe & Japan have brought down fresh water use per ton of paper, by about 25% over the past decade.
- In the U.S, since 1950, water use has reduced between 50 and 90 percent for every ton of paper produced

Despite these developments, the amount of water 'recycled' in the paper industry, at around 12% is still the lowest amongst water-intensive industries.

PROBLEMS AND SOLUTIONS

The most challenging part of achieving improved water management is to counteract the build-up of detrimental substances within the process and in the effluent.

- Enhanced recycling of process water causes an increase in the concentration of colloidal and dissolved organic and inorganic constituents. Depending on the characteristics of the pulp in-feed and the chemicals used in paper-making, a close watch has to be maintained on the resultant effects on the operation of the machine, end-product quality and more so the production costs - due to the increased use of chemicals.
- Water reduction methods depend greatly on the degree of closure desired. Finding a balance between the advantages and the drawbacks is the key. Acceptable levels depend on the paper grade produced, raw materials used and water and pulp circuit management.

Industry and research institutions across both sides of the Atlantic are working on numerous technologies for achieving cost-effective and more efficient wastewater treatment:

- Advanced treatment of paper-mill effluent using tertiary bio-filters (submerged aerated up-flow film reactors)
- Use of ozonation and wet oxidation for the treatment of thermo-mechanical pulp (TMP) circulation waters
- Advanced pulp and paper industry effluent treatment with a combination of ozonation and fixed bed bio-film processes
- Nitrogen fixation in the treatment wastewaters.

NORMS FOR WATER CONSUMPTION IN PAPERMAKING

The water footprint of printing and writing paper is estimated to vary between 300 and 2600 m³ / ton (2-13 litres for an A4 sheet).

INDUSTRY NEWS

JK Group is in talks with the Myanmar Govt. to allow it to operate the **Thar Paung Paper and Pulp Mill**. This will revive the ailing mill. The mill has a capacity to make about 70,000 MT of pulp annually. This can partly augment JK Papers growing pulp requirement.

Without recovery, the global average water footprint of paper would be much larger. By using recovered paper an estimated 40% is saved globally.

Large nonintegrated paper and board mills have the lowest median water use at 3,600 gallons per ton (~ 14 M³ / T), while dissolving chemical pulp mills have the highest median water use at 41,400 gallons per ton (~160 M³ / T).

Paper mills with production rates of less than 100 tons / day use more than double the amount of water per ton of product compared to mills with production rates greater than 100 tons / day.

INDIAN PAPER INDUSTRY

Excessive water usage is a yet another adverse characteristic of the Indian Paper Industry.

Average Water consumption in Indian paper industry	Global Best
Wood based mills – 150 to 200 M³ per Ton	50 to 75 M³ per Ton
Waste paper based mills – 75 to 100 M³ per Ton	10 to 25 M³ per Ton

Freshwater consumption by Indian mills is dangerously high for the health of the water bodies. To produce one ton of paper an Indian mill can use as much as 200 cubic meters of water, as opposed to 25 cubic meters in the industrialized world.

Reasons are attributable to: *multiple number of paper machines; use of mixed fibrous raw materials in absence of good quality forest based raw materials; use of conventional technology & equipment; and low levels of operation.*

Moreover in India water is priced in such a manner that extravagance in its use is prevalent. Mills should think in terms of harvesting rainwater and recycling it. The **Green Rating Project** introduced by the Centre for Science and Environment of the Govt. of India, seems to have had a formidable impact on the industry by taking the environmental management issue to top management levels.

THE PATH TO ZERO DISCHARGE

While the Indian average may be low, some Indian paper mills are already near to the global standards of water use : *ITC-PSPD, APPM, JK Paper, Seshasayee* and *BILT Group* are proud examples. High commitment levels and Top Management led initiatives have been the key.

Some of the steps taken :-

- Training and awareness programs for employees to initiate a 'water saving' culture.
- Reuse of Process Effluent by localized treatment.
- Treating effluent from stock preparation separately without sending to ETP.
- Rain water harvesting
- Closing the 'water loop' with reuse of Mill Treated Water
- Continuous Monitoring and Control to sustain the System.

MEASURES AND MONITOR



- Monitoring process plant drains leading to ETP to monitor discharge of effluent water and its characteristics.
- Establishment of Water balance principles and monitoring monthly, department wise.
- Monthly review against the norms for improvement.
- Annual water audit conducted by external agencies.

Benchmarking Specific Average Wastewater Discharge of Mills

European Pulp & Paper mills	47 M ³ / MT
Indian Pulp & Paper industry	180 M ³ / MT
Large Indian mills	127 M ³ / MT
Swedish RGP Mills	50 M ³ / MT
Indian RGP mills	160 M ³ / MT

CONCLUSION

The importance of conserving and reusing water cannot be overemphasized. For the Indian Pulp & Paper Industry reaching the world standards is not an impossible task – as some of our leading Indian paper mills have already shown. Perhaps the change will come when the cost of not doing it far exceeds the cost of doing even a little.

QUOTABLE QUOTE	<i>Life is like riding a bicycle. To keep your balance, you must keep moving - Albert Einstein</i>		
SCRABBLE	What does V O C stand for ? (Hint : Undesirable emissions) <i>First correct answer will win a Parker Vector Roller Pen (Maximum two prizes for one person in a year). Post / Fax / Email your answers to EDITOR-W&F SNIPPETS by 20th September, 2012.</i>		
WINNER AUG'12	Mr. Pradeep Kumar Shibahare, QC, ITC Ltd, PSPD, Bhadrachalam (AP) Answer : <u>T4S</u> : TRIMMED FOUR SIDES		
?QUIZ	Which of these are <u>not</u> paper 'grades' Manila, Onionskin, Bloodproof, Tobacco, Blueprint, Bristol, Candytwisting, Paris, Bible. Post / Fax / Email your answers to EDITOR-W&F SNIPPETS by 20th September, 2012.		
WINNER AUG'12	Mr. Mohd Naseem, Middle East Paper Co., GM -Production, Jeddah, Saudi Arabia Quiz : Place in order of cellulose content (highest to lowest) :- Bamboo, Hemp, Jute, Soft Wood, Wheat Straw Answer: Hemp , Jute , Soft wood , Bamboo , Wheat Straw		
 Prizes	1. Best / first correct answer received will win one-year subscription to IPPTA Journal (Maximum one prize for one person in a year). 2. Best of the 12 monthly winners in a year, will win one-year subscription to Paper 360^o Magazine, USA.		
 Ms Google	Question : Is 'Google' male or female. Answer : Definitely a female ! <i>Firstly. It won't let you complete the whole sentence before it starts 'guessing' and 'suggesting'. Secondly. You have to ask just one question, and in seconds you get hundreds of irrelevant answers.</i>		
Published by >>	Wires & Fabriks (S.A) Ltd, JAIPUR-302012, India.	Phone: 0141-2341722 Fax: +91-141-2340078 Email: snippet@wirefabrik.com	Only For Private Circulation

Website: www.wirefabrik.com

The contents & opinions expressed in this publication are of the writer/editor. The Company has not verified & may not subscribe to the same.