‘PULPING’ – NOT FOR PAPER

The ‘Paper World’ is transforming rapidly. Production of paper, newsprint and even packaging grades is gradually shifting from the Western Hemisphere to the countries of the East. This drift, in turn is creating ‘ripples of innovation’.

Canada is one of the world’s largest pulp producers, but after the closure of some large pulp/paper mills, industry leaders were left with just one choice : Innovate to survive. Two innovations born out of such pressures are: Fluff pulp and Dissolving pulp.

The move from traditional products to specialty pulp products, such as fluff & dissolving pulp is a strategy that has proved to be effective and life-saving to many.

FLUFF PULP

Fluff pulp (also called comminution pulp or fluffy pulp) is a type of chemical pulp made from long fibre softwoods. The most important parameters for fluff pulp are bulk and water absorbency. The cooking and bleaching of chemical fluff pulps do not significantly differ from the production of paper pulps but the web formation, wet pressing, and drying of fluff pulps do.

More than 95% of fluff pulps are delivered to the customer in rolls in which the moisture of the pulp varies between 5 and 10%. It is more costly to produce than paper-grade pulp because of tighter moisture and cleanliness controls as well as higher packing, handling and transportation costs.

Fluff pulps are used as raw material in the absorbent core of personal care products such as diapers, feminine hygiene products, air-laid absorbent towelling as such or in conjunction with super-absorbents or synthetic fibres. Today, over 80% of such pulps are used in baby diapers.

Worldwide, about 4 million tons of fluff pulps are produced per annum and fetch an average price of US$ 1050/MT. A growth of 6-7% / year is projected as new diaper (nappy) plants begin operating almost every week of the year in the emerging markets of Asia, the Middle East and Latin America.

USA enjoys an overwhelming leadership position today, primarily because of its existing forests of Slash Pine. Slash Pine has been proven to be the ideal fiber for Fluff Pulp because of its unusually thick walled fibers which create superior bulk, TWA (Total Water Absorbency) and excellent pad integrity.

The most demanding application of fluff pulps is in air-laid products, used in various towel applications in homes, industry and hospitals, as well as serving utensils. Airlaid products have gained worldwide acceptance for excellence in highly absorbent packaging for poultry, fruit and many other food products.

Fluff pulp is normally made of softwood pulp obtained by sulphate or sulphite pulping. Depending on the pulping method, the properties of fluff pulp differ from each other.

Hardwood pulp, preferably birch, when added to the softwood pulp such as pine, spruce, or a mixture of pine and spruce, yields a dense structure, thereby improving the strength of the product.

It is also possible to use mixtures of pulps obtained from different hardwood species such as aspen or eucalyptus as well as other fibres such as short textile fibres.

In recent years International Paper, GP and Weyerhaeuser have invested significantly and ramped up fluff pulp production.

Domtar Corporations’ Plymouth mill now produces exclusively Fluff Pulp. Plymouth Fluff pulp is produced utilizing a continuous digester system and an Elemental Chlorine Free (ECF) bleaching technology.

DISSOLVING PULP

Dissolving pulp (also called dissolving cellulose) is a bleached wood pulp that has a high cellulose content (> 90%). This pulp has special properties, such as a high level of brightness and uniform molecular-weight distribution.

Dissolving pulp is no ordinary wood pulp. It is a ‘specialty cellulose’ being a highly refined pulp used in products such as cellophane film and computer chips. Its primary use, however is in the manufacture of rayon, (regenerated cellulose), a man-made yarn used in the textile industry.

Dissolving pulp is made by the sulfite process or the kraft process with an acid prehydrolysis step to remove hemicelluloses.

Special alkaline purification treatments can yield even higher cellulose levels: up to 96 percent for the sulfite process and up to 98 percent for the sulfate process.

The 90-92 % cellulose content sulfite pulps are used mostly to make textiles (like rayon) and cellophane.

The 96% cellulose content sulfate pulps are used to make rayon yam for industrial products such as tire cord, rayon staple for high-quality fabrics, and various acetate and other specialty products.

Industry Intelligence, a US-based research firm gave the following report in 2011.

“With record-high cotton prices more and more textile producers are switching from cotton to synthetic and man-made cellulosic fibers, such as rayon from dissolving pulp.” “At the highest estimate some 23 million tonnes of commodity dissolving pulp supply would be needed by 2020 – a huge business opportunity for wood pulp producers.”

INDUSTRY NEWS

World over, consumption of paper & board is directly linked to the lifestyle of a country’s population. India is the 5th largest and the 2nd most attractive emerging retail market in the world.

In 2011 alone, more than 6 million sq. ft. of organized retail mall space was added. FDI in retail may bring in exciting opportunities. All this augurs well for the Indian Paper & Packaging industry.
Dissolving pulp is also the raw material of cellulose derivatives, and is used for production of carboxymethyl cellulose (CMC), methyl cellulose (MC), hydroxypropyl cellulose (HPC), hydroxyethyl cellulose (HEC), etc.

**CELLULOSE POWDER**

Dissolving pulp that has undergone acid hydrolysis, been mechanically disintegrated and made into fine powder is termed as Cellulose Powder. This pulp is used as a filler for urea-formaldehyde resins and melamine resin products.

Globally dissolving pulp usage has risen dramatically over the last decade and reached nearly 5 million tonnes per year of capacity today.

Södra Cell made a decision to invest in the production of textile pulp in December 2010. The Group is anticipating strong market development for textile pulp as it is renewable and timber-based, and is replacing cotton fibres.

Says Gunilla Saltin, president of Södra Cell "We are focusing on textile pulp as this is a growing market to which we can supply a certified, renewable forest raw material."

**NANOCRYSTALLINE CELLULOSE**

Nanocrystalline cellulose is a renewable, recyclable and abundant nanomaterial made of cellulose fibers from the wood pulp manufacturing process. The properties of this material will provide new opportunities in a wide range of applications for a variety of sectors and markets such as the aerospace, automotive, chemical, textile and forestry industries. It is an advanced material that improves the strength, durability and toughness of products. It can reduce damage caused by wear, abrasion and light.

Potential applications include optically-reflective films, high-durability varnishes, and innovative bioplastics. Natural, renewable, recyclable, compostable and bio-degradable, NCC also has the potential to become a contributor to the green economy in numerous industrial sectors in the coming decades.

**CONCLUSION**

Rapidly developing economies coupled with growing domestic demand for natural textiles, advanced health and hygiene products, and medical-food-and pharmaceutical ingredients in Asia, South America, and other areas of the world have created a literal “gold rush” for dissolving pulps and other fluff and cellulose pulp-derived products.

Global prices for dissolving pulps are currently at historical highs, and fluff pulps are also enjoying a technological and production renaissance as global demand rises. Good demand and good prices, is encouraging increased conversion of paper grade pulp mills to dissolving pulp.

With such rapid growth there is a need for caution. On the one hand, asking the right questions and addressing issues about market growth, supply possibilities, technology needs etc. will provide the right direction for further development of this niche segment of wood pulping. On the other hand, lower production of paper grade pulp would mean higher prices for the paper industry.

An ‘innovative approach’ towards ‘alternative pulping’ is here to stay. This is well summed up in the words of John D. Williams, President and CEO of Domtar Corporation.

"The remarkable properties of nanocrystalline cellulose and the wide range of potential applications speak volumes about the commercial potential of new fiber-based products that go beyond traditional pulp and paper applications. Our investment is part of a larger story at Domtar around unlocking greater value from wood fibre."

Continuous research and development would provide the much desired impetus for further product diversification into ‘high value’ segments of wood pulping.

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**QUOTABLE QUOTE**

Choose a job you like and you will never have to work a day in your life - Confucius

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**SCRABBLE**

What does **C F B** stand for ? (Hint : Carbonless Paper)

First correct answer will win a Parker Vector Roller Pen (Maximum two prizes for one person in a year).

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**WINNER FEB’12**

No answer received

Answer: **P A M** : PERIODICALS AND MAGAZINES

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**?QUIZ**

Choose the right options

The purpose of adding Sodium Silicate to the pulper in the deinking process is to :-

a) **Dissolve the ink** b) Suspend the ink c) Act as buffer d) Stabilize the peroxide.

Post / Fax / Email your answers to EDITOR-W&F SNIPPETS by 20th March, 2012.

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**WINNER FEB’12**

No answer received

Quiz : Choose the right option :-

Which among these is considered to be a ‘direct’ printing process. Why ?

a) Offset b) Digital c) Flexography d) Rotogravure

Answer: b) Digital

Digital printing is a method of printing from a digital based image directly to a variety of media.

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**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° Magazine, USA.

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**Loan Mela**

A man bought a car on loan. Failing to pay the installments, the bank took away the car. The man said “If I knew this, I would have taken a loan for my marriage too.”

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