

Declaration of INDEPENDENCE

Indian packaging and paperboard giant, ITC Paperboard & Specialty Papers, is well on its way to achieving the challenging ambition of becoming 100% self-sufficient in local wood and fiber supply for its Bhadrachalam Mill in the state of Telangana, Southern India. ANDRITZ's vast mechanical pulping knowledge, along with the latest proven technology, are instrumental in the company achieving its aim.

Southern India is an immensely fertile area where a variety of food staples and cash crops profusely grow including cotton, chillies, and rice, providing millions of people with food and tens of thousands of farmers with vital livelihoods. It is also the perfect region and climate for fast growing

eucalyptus, and therefore ideal for providing ITC's flagship mill with fiber for its integrated, high-quality packaging operation.

ITC launched the highly ambitious plan to use domestic fiber some time ago – mainly to alleviate the reliance on what

is a constantly volatile pulp market, but also to bring much needed extra forms of revenue to the local farmers. CEO of ITC's Paperboards & Packaging Division, Sanjay Singh, says, "Over a number of years we have been working on a plan with local farmers within a 200 km radius of the Bhadrachalam mill. We have been working hard at our plantation clonal research center, developing exactly the type of eucalyptus that we need firstly – which will make good pulp for our products but also will be an attractive longer-term crop for the farmers to grow."

Around 15,000 farmers now supply the mill with wood for its pulping operations, growing eucalyptus in rows around existing crops, which means as well as a regular income from crops such as cotton and chillies, they can now also have a longer-term investment from the trees.

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SANJAY SINGH
CEO of ITC's Paperboards & Packaging Division



"The quality of the wood is very important," continues Singh. "To achieve optimum quality, the wood needs to grow for the longest possible period, and we have to convince the farmers about this. So, for example, if they left the wood in the ground for five or six years, they would earn a lot more money because of the yield, say compared to three years. Our hard work on this front has paid off, and we are now virtually self-sufficient in local fiber at the mill."

TOP QUALITY FIBER NEEDS TOP QUALITY PULPING TECHNOLOGY

After all the work that has gone into making sure there is enough high-quality fiber for its production needs, the next step for ITC was to find the very best in technology for its mechanical pulping operation. This was going to be a challenging task, as ITC had some extremely demanding parameters when it came to quality, efficiency, and environmental performance.

The new pulping operation would have a design capacity of 300 admt/d and, most importantly for ITC, the line had to work with a zero-effluent concept. The final pulp should have a very low Chemical Oxygen

Demand (COD), as a lot of its products are used for food packaging (note: COD, is a measure for dissolved detrimental substances present in pulp and effluents of a mill). ITC also wanted to utilize synergies with other processes on site in an effort to ensure sustainability and to keep raw material consumption and running costs to a minimum. For instance, BCTMP effluent is sent to the mill's integrated kraft mill where it is evaporated together with the kraft mill black liquor and clean condensate is sent back to the BCTMP plant where it is used for pulp washing. This not only keeps the mill effluent low but also reduces consump-

tion of fresh water, which is a welcome plus in the Telangana state. Furthermore, chemicals from the BCTMP effluent are recovered in the mill's recovery boiler and recausticizing plant and oxidized white liquor can be used as an alkali source in the mechanical pulp mill.

K Nagahari, Divisional Head – Projects, ITC Paperboards & Specialty Papers Division, says, "We took a long time searching for exactly the right technology that would suit our operation at Bhadrachalam. We travelled around, particularly in China, where we looked at various suppliers'

Refining is the heart of each mechanical pulping process.



Conveyor feeding chips into the mill.



Row of ANDRITZ Screw Presses for the washing stage.



ITC Bhadrachalam mill operation team and ANDRITZ sales team from left to right: Kunisetty Rambabu - Chief Manager - Pulp Mill; AV Hari Krishna, Manager - Pulp Mill & BCTMP; KD Sharma, General Manager - Pulp Mill; Thomas Paar, ANDRITZ; A. Shiva Prasad, General Manager Projects; Rao Narayana, ANDRITZ

mechanical pulping references, but after careful and thorough examination, we decided that ANDRITZ BCTMP technology would suit us best – mainly because of its vast experience and flexibility of its processes.”

Added to the reference visits, ITC and ANDRITZ set up pilot plant trials in 2015 at ANDRITZ’s facility in Springfield, USA. Nagahari says, “In 2015, we carried out extensive trials with eucalyptus wood species at the Springfield pilot plant, and the results we achieved there gave us even more confidence.”

ANDRITZ first presented its BCTMP concept to ITC in 2010, with reference visits in China the following year. In 2014, ITC was able to experience first-hand, again in China, ANDRITZ’s patented, very latest technology in BCTMP, Pre-conditioning Refiner Chemical Alkaline Peroxide Mechanical Pulping (P-RC APMP) technology.

Thomas Paar, ANDRITZ Pulping & Fiber Division, says, “The new P-RC APMP pulping line is the ideal technology for ITC’s raw material and products. The P-RC APMP process is ultimately designed for optimum pulp properties, such as brightness, strength, and bulk. The process impresses with minimum chemical, energy, and water consumption for all hardwood species.

The P-RC APMP system incorporates the long-term experience of ANDRITZ in mechanical pulping technology combined with its tradition as machine manufacturer and

contract partner for the pulp and paper industry. The dedication of ANDRITZ to the constant development of process technologies and equipment is reflected by the fact that nowadays ANDRITZ has a major worldwide market share in supplies to the pulp and paper industry.”

NEW TECHNOLOGY FOR INDIA

From contract signing to start-up it took around 14 months, with the actual start-up of ITC’s P-RC APMP line taking place in March 2017. Markarand Barhanpurkar, Unit Head, Bhadrachalam, says: “The start-up of the BCTMP line has seen a real boost in morale at the mill, mainly because it is a first for an Indian company to install this new type

of technology. In fact, the whole process was new to us, so we have needed a lot of support from ANDRITZ engineers who bent over backwards to provide everything that we needed.

“Of course, as in every project, there have been teething problems, but together we have solved those, and we believe the preliminary learning curve has passed. As our operators’ confidence has grown in the whole process, ANDRITZ has stepped back a little, but we know they are always there if we need any extra expertise.”

The project to install the P-RC APMP technology at the Bhadrachalam mill represents

a first for India – there are very few mechanical pulping operations in the country. For ANDRITZ, the installation is the latest in a long line of P-RC APMP lines, with over 35 systems operating worldwide.

THE BOTTOM LINE

Vadiraj Kulkarni, Chief Operating Officer, ITC Paperboards & Specialty Papers Division says of the difference the new mechanical pulping line is making, “We are delighted to be the first company in India to have invested in the P-RC APMP line. It goes perfectly with our strategy of promoting plantations in India and helping farmers to enhance their earnings, which is, of course, good for them.

“Most importantly, the project has allowed us to reduce our dependency on foreign imports of chips and market BCTMP, which has been very high in the past, and we are delighted that this technology and expertise has led us into this enviable position so quickly. Yes, making mechanical pulp has its own challenges, but we are pleased to have such a strong technical team behind us in ANDRITZ, and we believe we will soon be the leaders in this field.”

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K NAGAHARI
Divisional Head – Projects,
ITC Paperboards & Specialty
Papers Division



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Unit Head, Bhadrachalam



GETTING TECHNICAL

Getting technical on the next page.



GETTING TECHNICAL

THE BCTMP SCOPE AT ITC

The project scope at ITC covers the complete process line from chip washing to storage tower and is perfectly suited to the mill's demands of flexible production of high-quality pulps at the most economic operating costs.

The advanced and patented P-RC APMP (Pre-conditioning Refiner Chemical Alkaline Peroxide Mechanical Pulping) technology applies chemicals (oxidized white liquor, sodium hydroxide (NaOH), and hydrogen peroxide (H₂O₂)) in impregnation and after the primary refiner. The 2-stage MC-HC bleaching system is located right after the primary refiner, but before secondary refining and screening. A washing stage was added before the first bleaching tower to remove detrimental substances and ensure optimum bleaching results and minimum peroxide consumption.

At ITC, the process is designed as a single line starting with chip washing followed by chemical impregnation with the unique ANDRITZ MSD Impressafiner. The MSD Impressafiner compresses the chips and thus removes dirty liquor from the chips and opens up the chip structure before the chemicals are applied in the impregnation stage. In particular, with the local eucalyptus woods with its high extractives contents and high dryness, this is an important step before refining and bleaching to reach high brightness and keep the chemical consumption low.

Refining is the heart of each mechanical pulping process. At ITC, it is designed as a single line, 2-stage refining process with an ANDRITZ HC refiner in the first stage and a single-

stage ANDRITZ TwinFlo LC refiner as the second stage. There is also an ANDRITZ TwinFlo refiner installed for reject refining.

The low-consistency pressure screening system consists of proven ANDRITZ ModuScreens with highest screening efficiencies to remove shives and undeveloped fibers. In addition, a cleaner system is installed to remove dirt particles and so-called stone cells (or "scleroids"). In order to reduce COD and other dissolved substances in the final pulp to a minimum level and also

keep the amount of wash water and effluent as low as possible, six counter-current washing stages with ANDRITZ Screw Presses are included. Thus, the Bhadrachalam mill sets a world record for any the lowest COD in final pulp.

After the MC storage towers, the pulp is

sent directly to the mill's three paper machines where it is used for the production of different paper board grades.

The BCTMP effluent is sent to the mill's integrated kraft mill, where it is evaporated, burned, and chemicals are recovered. On the other hand, clean condensate and oxidized white liquor are sent from the kraft mill to the BCTMP plant.

The project also includes an ANDRITZ Heat Recovery System to treat the process steam coming from the HC refiner to produce clean steam that is then used in the effluent evaporation system.

