

SUCCESS STORY



PULP & PAPER

BAMBOO TIGERS

TAISON GROUP'S TWIN *PrimeLineSTs*

ANDRITZ

ENGINEERED SUCCESS



Bamboo Tigers – Taison Group's Twin *PrimeLine*STs

Set among thickly bamboo-forested hills, interspersed by valleys with clear running streams and impressive waterfalls, the Guizhou Chitianhua Paper Industry's tissue mill is one of the most environmentally important production facilities in the rapidly growing Taison Group. ANDRITZ recently supplied the mill with two *PrimeLine*ST tissue machines including complete stock preparation to keep the growth on track.

Situated quite some distance away from any mass industrial developments or highly populated conurbations is Taison Group's Guizhou Chitianhua Paper Industry's tissue mill near the town of Chishui in southwestern China. The Taison Group has a number of major board and tissue production facilities in China, and has a growth plan that will see it become one of the nation's top five producers by 2020. General Manager at Guizhou Chitianhua tissue mill, Wang Hongwei, says, "The Taison Group will reach a total capacity of 5 million tonnes this year; however, with our ongoing expansion plans throughout the group, we will reach 8 million tonnes a year by 2020, making us one of the largest producers of paper, board, and tissue in China."

The group is not limited to domestic expansion; it also recently acquired Swedish company Nordic Paper Holdings, which includes four specialty paper mills in Scandinavia.

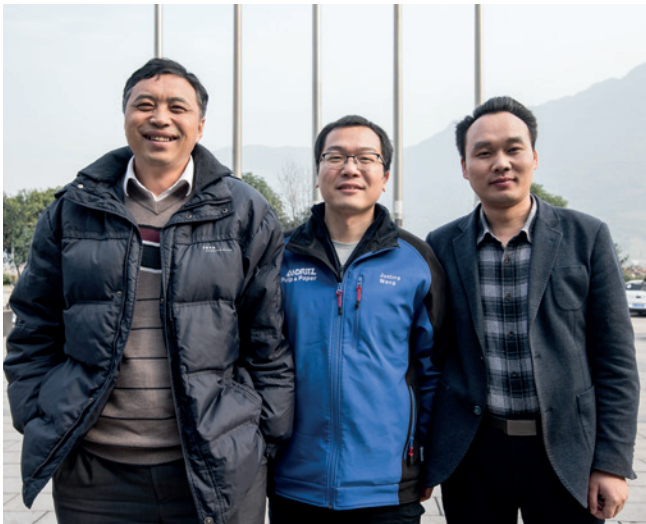
TISSUE – UNPRECEDENTED GROWTH

Tissue is of major importance to the group's expansion plans, as China sees an unprecedented growth in demand. According to Wang Hongwei, consumption of tissue is growing at around 6% per year.

The Chitianhua mill was originally owned by the Chinese government, which was struggling to make it profitable producing printing and writing paper using bamboo as raw material. The mill was sold to the Taison Group in 2015, and was immediately converted into producing tissue using bamboo as the main fiber source.

"This is the perfect area for a mill producing tissue out of bamboo, as we have a virtually unlimited source of raw material," says Wang Hongwei. "We are producing bamboo pulp here at a full capacity of 250,000 tonnes a year, consuming some 1 million square meters of local fiber which comes from land we rent from the government. Bamboo is a fantastically sustainable source of fiber as basically the more you cut, the more it grows."

Legend has it that in 1769 AD Li Litai, a migrant from Fujian province, brought four bamboo plants to the town of Chishui, and 100 years later there was total forest coverage. The prolific plant species now provides some 200,000 local inhabitants with a way to make a living, making the Chitianhua mill very popular in the area. In fact, the Chinese government has



Left to right: Wang Hongwei, General Manager, Guizhou Chitianhua Mill; Wang Junling, Start-up Engineer, ANDRITZ; and Hongwei Sheng, Department Administration Manager, Guizhou Chitianhua



Excess water from the tissue machine is handled in two DiscFilters Saveall, where micro fibers in white water are recovered. This system minimizes fiber loss and lowers fresh water consumption in the mill.



The *PrimeDry* Steel Yankee is made entirely of steel, has a diameter of 20 feet, and hence is among the largest in the world.



The stock preparation system consists of two lines. One is for LBKP market bale, and the other one for bamboo self-made slurry pulp.

awarded a special certificate to the mill in recognition of social and environmental efforts it has made since tissue production began here.

IDENTICAL TWINS – TM5 AND TM6

When the Taison Group took over the mill, ANDRITZ was chosen as supplier for two identical tissue machines, *PrimeLineSTs* with design speeds of 2,000 m/min and a width of 5.6 m each. "ANDRITZ is clearly seen as the No. 1 supplier by the Taison Group," says Wang Hongwei. "The management at the group wanted the very best and most modern machines, which is why ANDRITZ was chosen.

"Another reason ANDRITZ was selected was for its vast experience in producing tissue out of bamboo pulp," adds Hong.

The mill uses about 70% bamboo pulp as raw material with the other 30% made from softwood market pulp.

Along with the two *PrimeLineST* tissue machines, ANDRITZ also supplied two complete stock preparation lines. Wang Junling, ANDRITZ (China) Pulp and Paper Technology Start-up Engineer, says, "Using bamboo as a raw material to produce tissue throws up a number of challenges regarding stock preparation, in particular, regarding refining. Bamboo pulp has shorter fibers and is therefore weaker than wood fiber. To make sure we meet the raw material requirements at the mill, TwinFlo-Strong refiners with higher motor power, lower flow, and matched refiner fillings were installed."

The tissue machines were the first of their kind delivered in China to combine high performance *PrimeDry*

Steel Yankees with steam-heated hoods. The Yankees are made entirely of steel and have a diameter of 20 feet – among the largest in the world for tissue. Both Yankee cylinders are manufactured at the ANDRITZ steel Yankee business center in Foshan, China, which offers customers state-of-the-art manufacturing, local field service, and quality management.

The maintenance of steam-heated hoods challenged the efficiency of tissue machines in the past. To solve this problem, ANDRITZ delivered a new design: The *PrimeDry* Hood ST is equipped with double-width nozzle boxes for easy maintenance, where each nozzle has its own cleaning port. The hood offers optimized impingement pattern and an open area for efficient drying at minimum dust accumulation.

Along with the stock preparation line and tissue machine, ANDRITZ also supplied automation with its tailored system for tissue *PrimeControl*, including DCS and QCS, as well as all erection and commissioning services.

Contracts were signed for TM5 and TM6 in December 2015 and commissioning took place respectively in July and September 2017. TM5 started up in August 2017 followed by TM6 in October.

Hongwei Sheng, Chitianhua's tissue production expert has already had a lot of experience with ANDRITZ machines at the mill, and was brought in specially to oversee the start-ups and successful continuing operation of the two tissue machines. Sheng says, "I was previously at our operations in Hengan, so I already had a lot of experience with starting up and operating ANDRITZ *PrimeLine* machines, also with Yankee cylinders.

"What was new for me was the incorporation of the steam-heated hoods on TM5 and TM6 and, of course, the bigger sized Yankee at 20 feet in diameter."

Sheng reports that the start-up of both machines went very well and according to plan, "This is the biggest tissue project in the Taison Group, and is a very important one for us – it had to go right! These machines are basically identical and we successfully started up TM5 in August last year, quickly followed by the TM6 in October.

"We are now producing 260 tonnes a day of the highest quality tissue in the group, with both machines producing 130 tonnes a day each," adds Sheng.

"The management at the group wanted the very best and most modern machines, which is why ANDRITZ was chosen."

Wang Hongwei
General Manager
Guizhou Chitianhua tissue mill



"The customer demanded a quick start-up. Starting up the two tissue machines at once proved to have big advantages."

Wang Junling
Start-up Engineer
ANDRITZ





ANDRITZ supplied two identical tissue machines, *PrimeLine*STs, with design speeds of 2,000 m/min and a width of 5.6 m each.

And what difference has the extra-large Yankee made, added with the steam heated hoods? Sheng says, "As well as maximum output and high-quality products, energy consumption is a very important issue for us. ANDRITZ suggested that with the combination of the steam heated hoods and the increased size of the Yankee, we could get more capacity, longer drying time, and reduced energy costs. And yes, so far we really are noticing a clear difference in comparison to other lines in the group."



The fully integrated mill makes tissue using bamboo as its main source of fiber. ANDRITZ also supplied the original fiberline.



Wang Junling says of the start-up from ANDRITZ point of view, "This project was a challenging one, as the customer demanded a quick start-up, so everyone had to work very hard to make the target. The *PrimeLine* technology was also new to a lot of the people at the mill, so there was a steep learning curve.

"However, starting up the two machines at once proved to also have advantages. What we learned on the start-up of TM5 meant that we were able to start up TM6 four days ahead of schedule!"

ONWARDS AND UPWARDS

General Manager Wang Hongwei says that there is still a lot of further scope for expansion at the mill, "Our bamboo pulping operation is running at full capacity of 250,000 tonnes a year, and we are only using half of that pulp on TM5 and TM6, the rest of the pulp is sold onto the market. Our plan is to use all that pulp at this mill for our own products, making us even more of a cost leader and capturing even more market share.

"ANDRITZ, of course, will also be joining us in our success!"

To underline the Taison Group's expansion plan, it has already ordered another four tissue lines from ANDRITZ.

Getting Technical

STOCK PREPARATION:

The system comprises two lines – one for LBKP market bales, one for bamboo self-made pulp.

THE LBKP LINE:

Market bales are dissolved in the FibreSolve FSV pulper to allow high consistencies of up to 7.5%. Slushing is done by the impact effect of the pulping rotor and the friction within the pulp itself, but without damaging the fibers. HD cleaning removes coarse particles such as grit and sand. Flakes are destroyed and fiber-flocks separated by means of deflaking.

THE BAMBOO LINE:

Pulp cleanliness is the most critical part. ANDRITZ designed special screening and refining stages to meet the very high demands. TwinFlo-Strong refiners make the most out of the difficult-to-handle bamboo fibers in order to keep the fiber length and enable ideal fibrillation with less cutting of fibers.

APPROACH SYSTEM

ModuScreen HBE screens are the key equipment of the approach flow system in the felt and wire layer and ensure lowest energy requirements with minimum pulsations and superior protection of the tissue machine.

FIBER RECOVERY

Two DiscFilters Saveall handle excess water from the tissue machine and recover micro fibers in the white water to minimize fiber loss and lower fresh water consumption in the mill.

BROKE SYSTEM

In a continuous process the under machine pulper FibreSolve FSU disintegrates broke to a consistency of up to 3-4%; HD cleaning and deflaking remove impurities and fiber bundles. A vertical trim pulper, type FibreSolve FSVc, processes the trim at the rewinder.

TISSUE MACHINES:

ANDRITZ delivered two *PrimeLine*ST W20 tissue machines, with automation, DCS, and QCS. The two tissue machines are currently unique on the Asian market because they combine a high-performance Yankee with a steam-heated hood. The *PrimeDry* Steel Yankee is made entirely of steel, has a diameter of 20 feet, and hence is among the largest in the world. The combination of steam-heated hood and steel Yankee enables a high drying capacity and achieves remarkable cost savings compared to systems operated with gas.

KEY COMPONENTS

PrimeFlow 2-layer with dilution control
PrimeForm Crescent Former
PrimePress Single Press
PrimeDry Steel Yankee 20ft
PrimeDry Hood ST
PrimeReel Advanced
PrimeDustEx W (Wet Dust Removal System)

AUTOMATION

ANDRITZ supplied automation with its tailored system for tissue, *PrimeControl*, including DCS and QCS, as well as all erection and commissioning services. Delivery of cabinets has naturally been conducted ready-to-connect and pre-tested. 1,400 I/Os were allocated according to the process areas. The DCS is equipped with diagnostic capabilities and enhanced with OPE, an online diagnostic system that provides dedicated access to the DCS with remote connection, which will reduce downtime and increase responsiveness and accurate diagnosis in critical situations. FAT was offered in a time period of one week. Before and during start-up, ANDRITZ experts conducted training for on-site operators as well as for DCS engineers.





PrimeLine TISSUE MACHINES WITH KEY COMPONENTS THAT SAVE RESOURCES

PrimeLine tissue machines are widely embraced by the global tissue industry: not only due to proven performance, but also for innovations that are available now. The machines are equipped with the *PrimeDry* Steel Yankee, the PrimePress XT Evo shoe press, and the *PrimeDry* HeatRecovery ReEvaporation system which help to achieve remarkable resource savings.

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