

PAPER CHINA

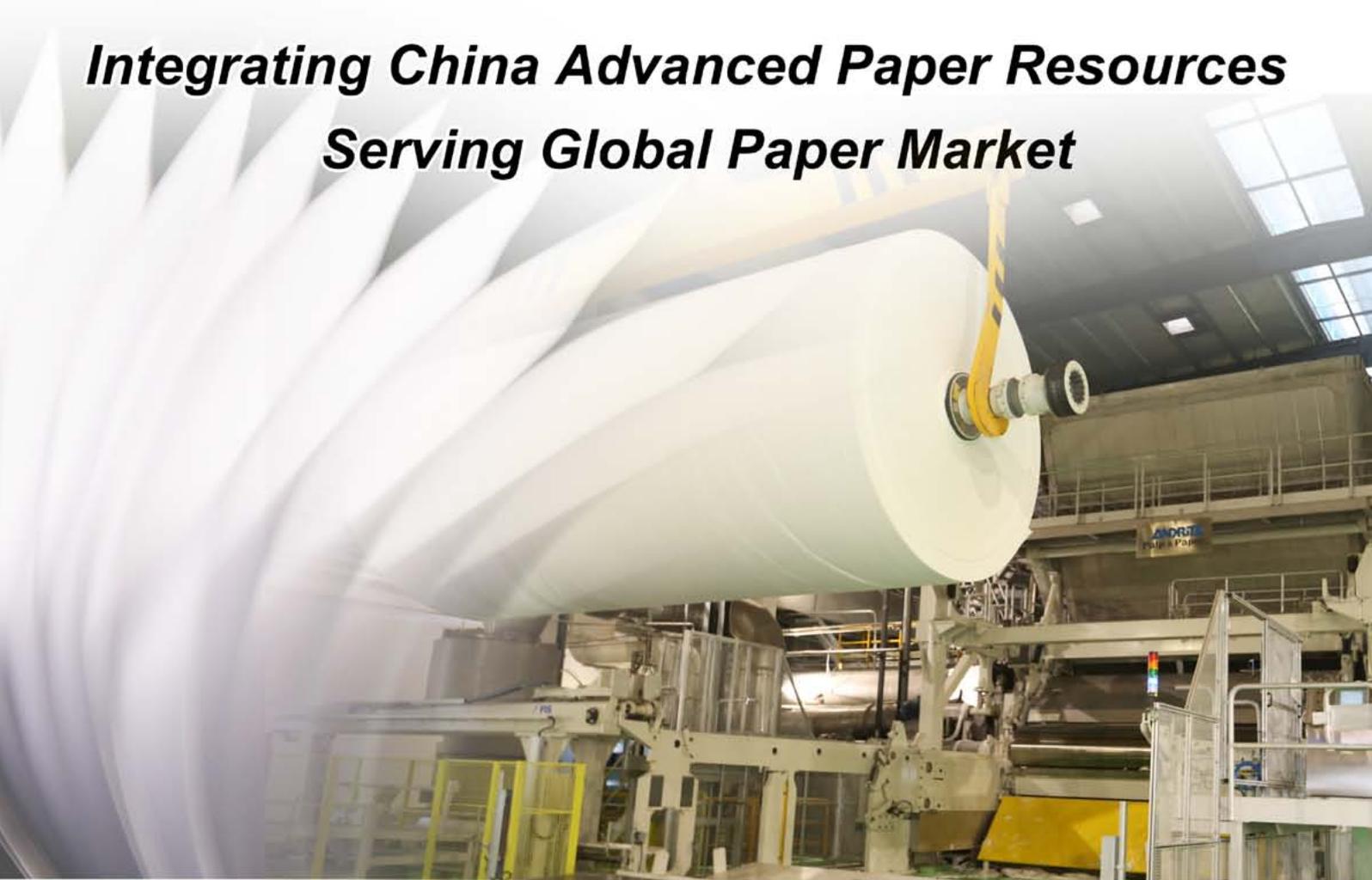
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October, 2017
Volume 1



China Pulp&Paper International Alliance

*Integrating China Advanced Paper Resources
Serving Global Paper Market*



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October, 2017

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China Top20 Paper

● China Pulp & Paper Industry Publishing House (by Yang Chenming)

TOP
20

The annual report of “China Top20 Paper Manufacturers”, ranked and evaluated by business revenues of enterprises, was carried out again in 2017 as the 11th special report by China Pulp & Paper Industry Publishing House(CPPI) who has been devoted to it for over a decade from 2006. Top20 paper manufacturers perform as the leading locomotives and growing dynamics for China paper industry, in which these leading units play an essential role as the developing models guiding the direction of industrial development.

Table 1 China Top 20 Paper Manufacturers 2017

Rank	Company	Main business revenue /million yuan	Output of paper and board /thousand tons	Location
1	Chenming Paper Group Co., Ltd.	73,900	4,360	Shouguang, Shandong province
2	Huatai Group Co., Ltd.	66,700	3,190	Guangrao, Shandong province
3	Nine Dragons Paper (Holdings) Limited	48,700	13,310	Dongguan, Guangdong province
4	Shandong Sun Paper Industry Joint Stock Co., Ltd.	44,200	4,980	Yanzhou, Shandong province
5	China Paper Corporation	20,800	2,620	Beijing
6	Hengan International Group Co., Ltd.	19,300	1,140	Jinjiang, Fujian province
7	Lee & Man Paper Manufacturing Co., Ltd.	16,400	5,430	Dongguan, Guangdong province
8	Shandong Tralin Group Co., Ltd.	14,700	930	Gaotang, Shandong province
9	Shanying International Holdings Co., Ltd.	12,100	3,540	Ma'anshan, Anhui province
10	Vinda International Holdings Limited	10,800	1,040	Jiangmen, Guangdong province
11	Gold Hongye Paper Group Co., Ltd.	9,800	1,820	Suzhou, Jiangsu province
12	Hainan Jinhai Pulp & Paper Co., Ltd.	8,300	1,090	Yangpu, Hainan province
13	Gold East Paper (Jiangsu) Co., Ltd.	8,200	2,080	Zhenjiang, Jiangsu province
14	Asia Symbol (Shandong) Pulp and Paper Co., Ltd.	8,100	470	Rizhao, Shandong province
15	Shandong Bohui Paper Group Co., Ltd.	7,800	1,980	Huantai, Shandong province
16	Fujian Liansheng Paper Industry Co., Ltd.	7,700	2,350	Zhangzhou, Fujian province
17	XXX	5,900	760	
18	Ningbo Zhonghua Paper (including Asia Pulp & Paper)	5,800	2,240	Ningbo, Zhejiang province
19	Shandong Century Sunshine Paper Group Company Limited	5,700	1,250	Changle, Shandong province
20	Long Chen Paper (China) Co., Ltd.	5,200	1,900	Wuxi, Jiangsu province etc.
	Total	400,000	56,480	

Notes: 1. The form is ranked according to the data that has been collected; 2. The company ranking No.17 is unwilling to release its relevant information; 3. The business revenue of Vinda and Lee&Man was transferred to Chinese yuan from Hong Kong dollars; 4. Heng'an and Vinda's output data in 2016, which was not acquired by us, was ranked according to their productive capacity by the end of 2016.

Manufacturers 2017

As can be seen in Table 1, top 20 paper enterprises mainly distributed in China eastern and southern areas featuring a larger population and better economic and transportation conditions. Table 2 shows that, in 2016, the business income of the Top 20(400 billion yuan, or \$60.2 billion dollars) accounted for 45.8% to the total income(872.5 billion yuan) of all the 2757 designated paper enterprises in China. The output of paper and paperboard of the Top20 was up to 56 million tons, contributing nearly 52% to the total output of paper and paperboard nationwide.

It's worth saying that the lowest threshold of business income for the Top20 exceeded 5 billion to reach 5.2 billion yuan, and the income of the top1 listed (Chenming) has even surpassed 70 billion yuan. The average annual business income of top20 was up to 20 billion yuan, according to Table 1.

From the perspective of business income, China Top20 units can be classified into four level groups. Chenming and Huatai have a commanding lead in China paper industry; Nine Dragon, Sun Paper and APP(China) followed tightly with their income reaching over 40 billion yuan; China Paper Corporation, Hengan, Lee&Man, Tranlin, Shanying, Vinda and Bohui are in the third group, with their incomes between 10-20 billion yuan; Asia Symbol(Shandong), Liansheng, Century Sunshine and Long Chen Paper(China) stay behind the third level, with the incomes between 5-10 billion yuan; and Jianhui Paper, Jingxing Paper, UPM(China) and C&S are potential members to enter the top20 in the coming year.

China paper market has gone through a rapid rise from the second half of 2016 to 2017. It's predicted that the comprehensive power of Top20 will continue to rise step by step. The year of 2018 is expected to witness a brighter prospect of leading paper manufacturers in China paper industry.

Industry Focus

Table 2 Details of Top 20 Paper Manufacturers

Company	Chairman	General manager	Year of establishment	Manpower	Major products
Chenming Paper Group Co., Ltd.	Chen Hongguo	Chen Hongguo	1958	13,500	offset paper, coated art paper, white cardboard, light weight coated paper, copy paper, tissue, thermo-sensitive paper, glassine
Huatai Group Co., Ltd.	Li Jianhua	Li Xiaoliang	1976	15,000	newsprint, printing and writing paper, art paper
Nine Dragons Paper (Holdings) Limited	Cheung Yan	Liu Mingzhong (chief executive)	1995	16,000	packaging paperboard, printing & writing paper, specialty paper
Shandong Sun Paper Industry Joint Stock Co., Ltd.	Li Hongxin	Li Hongxin	1982	11,800	high-grade coated packaging board, coated art paper, writing and printing paper, special fiber dissolving pulp, tissue, industrial packaging paper
China Paper Corporation	Huang Xin	Zhang Qiang	1988	13,497	printing & writing paper, coated ivory board, cardboard, carbonless copy paper, thermo-sensitive paper, labels
Hengan International Group Co., Ltd.	Shi Wenbo (board chairman)	Xu Lianjie (chief executive)	1985	-	household paper, sanitary napkins
Lee & Man Paper Manufacturing Co., Ltd.	Li Wenjun	Li Wenbin (CEO)	1994	7,200	kraft board, corrugated medium, coated grey-shading ivory board, bamboo pulp, tissue
Shandong Tranlin Paper Co.Ltd	Li Hongfa	Li Hongfa	1976	14,000	unbleached printing & writing paper, unbleached tissue, food wrapping paper, fulvic acid fertilizers
Shanying International Holdings Co., Ltd.	Wu Mingwu	Wu Mingwu	2001 (time of being listed)	8,817	boxboard, corrugated medium & board, newsprint, printing paper
Vinda International Holdings Limited	Li Chaowang (board chairman)	Johann Christoph (chief executive)	1985	11,000	toilet paper, paper towels, facial tissue, personal care products
Gold Hongye Paper Group Co., Ltd.	Huang Zhiyuan	Yu Jing	1996	10,043	tissue, paper towels, moist wipes
Hainan Jinhai Pulp & Paper Co., Ltd.	Huang Zhiyuan	Liu Ruofei	1999	2,534	bleached sulfate eucalyptus pulp, printing & writing paper, tissue
Gold East Paper (Jiangsu) Co., Ltd.	Huang Zhiyuan	Wang Zili	1997	3,400	coated art paper
Asia Symbol (Shandong) Pulp and Paper Co., Ltd.	-	-	2005	2,063	high-grade dissolving pulp, BHKP, NBKP, food wrapping board
Shandong Bohui Paper Group Co., Ltd.	Zheng Pengyuan	Chen Chunfu	1991	4,990	ivory board, printing & writing paper, boxboard, kraft board, Gypsum paper
Fujian Liansheng Paper Industry Co., Ltd.	Chen Jiayu	Chen Jiayu	2004	3,000	coated ivory board, coated kraft board, high-strength corrugated paper, high grade kraft paper, bobbin fibre paper, grey board
-	-	-	-	-	-
Ningbo Zhonghua Paper (including Asia Pulp & Paper)	Huang Zhiyuan	Liu Jichun	1992	2,815	high-grade white cardboard, coated art paper, ivory board, cigarette paper, art paperboard
Shandong Century Sunshine Paper Group Company Limited	Wang Dongxing	Wang Changhai	2000	3,000	(coated) white top testliner, paper tube, pre-printing materials
Long Chen Paper (China) Co., Ltd.	Zheng Yingbin	Yao Changkun	1993	2,970	industrial paper, corrugated medium and board

Notes: "-" represents the information not acquired or statistics that the company unwilling to make it open.

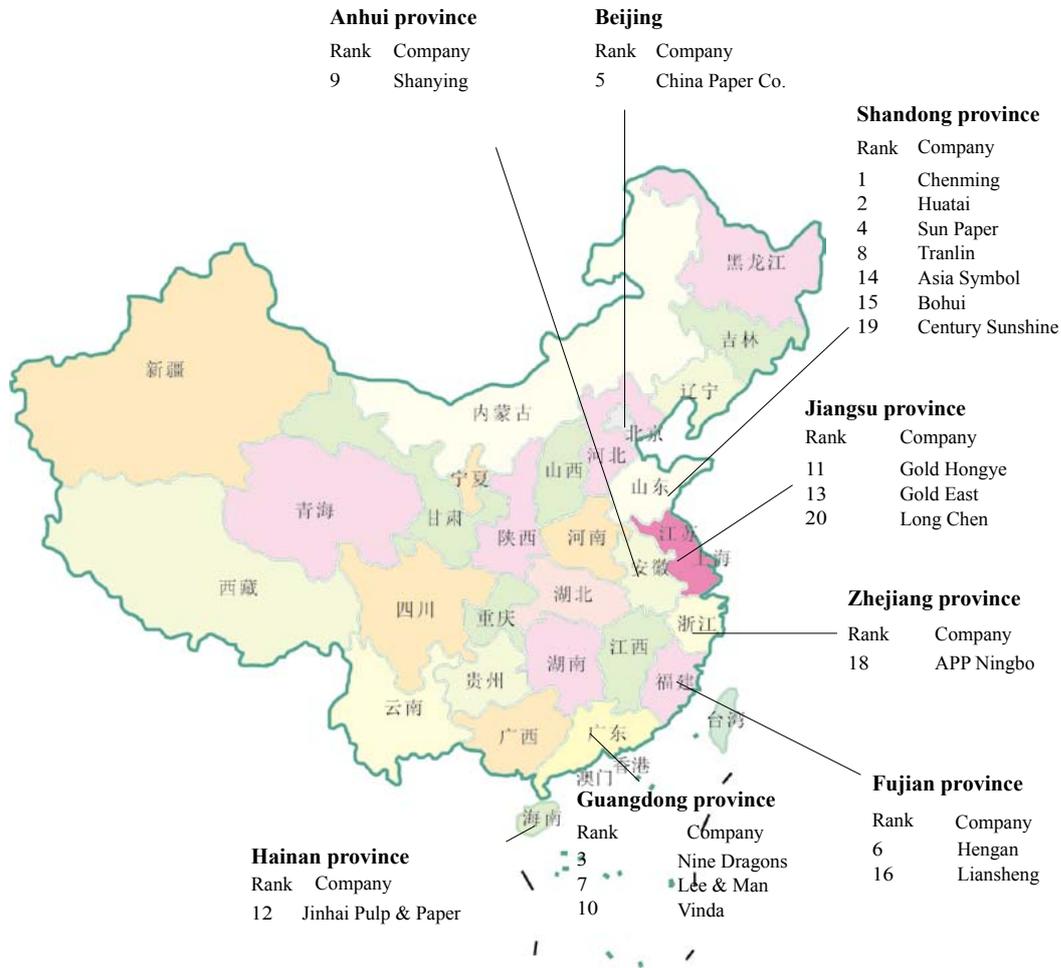


Figure 1 Distribution of Top20 Paper Manufacturers 2017

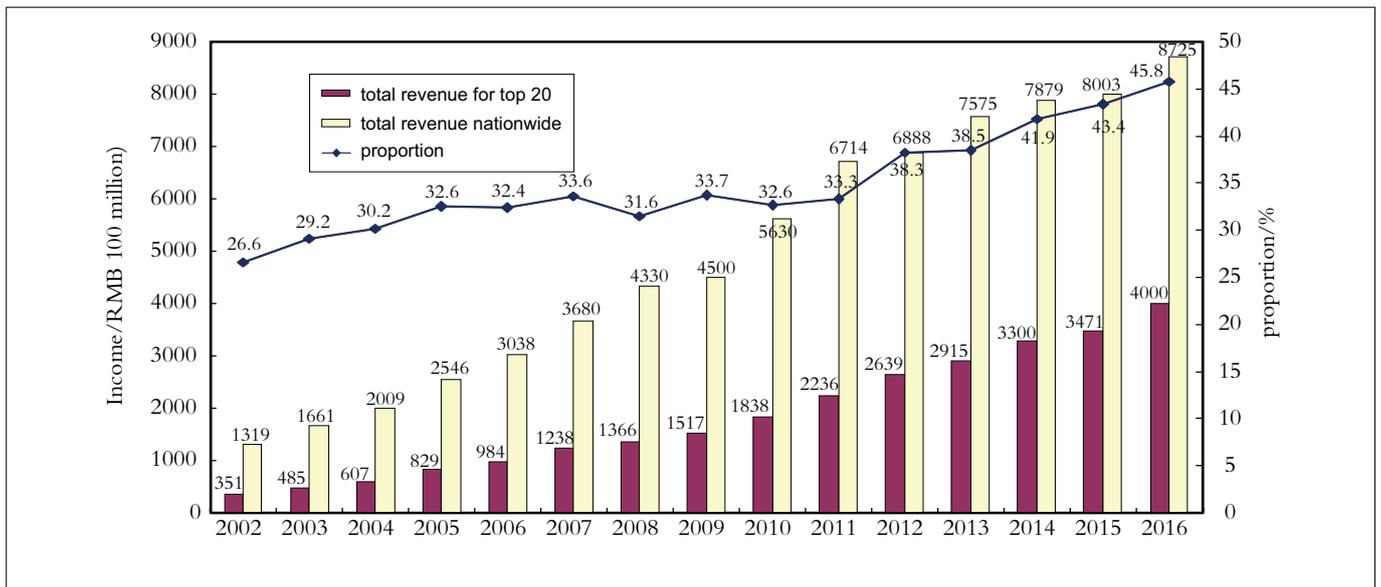


Figure 2 Development Trendency for Business Revenues of Top20 Paper Manufacturers 2002~2016

► Industry Focus

Top3 Paper Manufacturers in China Top20 2017



Chenming Paper Group Co., Ltd.

Headquarter: Shouguang, Shandong province

Major products: offset paper, coated art paper, white cardboard, light-weight coated paper, copy paper, tissue, thermo-sensitive paper, glassine



Chen Hongguo, chairman

Chenming Paper Group Co., Ltd. is a large-scale enterprises group that integrates paper, finance, yarn, real estate sector and the field of mineral, and sets foot in the field of forestry, logistics and engineering. Chenming's total assets values over 100 billion yuan, and the annual productive capacity of pulp and paper exceeds 10 million tons, with its manufacture bases distributing in Shandong, Guangdong, Hubei, Jiangxi, Jilin, etc.

Performance in 2016:

Main business income: CNY 73.9 billion

Paper and board output: 4.36 million tons

Profit: CNY 3 billion

Highlights:

- ★Liquid packaging paper project of 600 thousand tons was put into operation successfully by Chenming(Zhanjiang) company in October, 2016.
- ★Chenming's financial company developed rapidly, contributing over 40% of group's total revenue in 2016. The total assets of financial leasing company values over 32 billion yuan, ranking No.5 of over 3000 foreign-funded financial leasing companies in China.

Dynamics:

- ★The business turnover reached about 1.75 billion yuan in the first half of 2017, with a 86% year-on-year growth.
- ★Jointly operating three multi-functional wharfs(50 thousand tons each) with Malaysia Sime Darby Group in Weifang Port.
- ★Signing strategic cooperation agreement with Weidu District Government(Xuchang, Henan province), according to which a 1.2 million tons/a high-end packaging line will be established.



Forest-pulp-and-paper integration production base by Chenming Group(Zhanjiang)



Huatai Group Co., Ltd.

Headquarter: Guangrao, Shandong Province

Major products: newsprint, printing & writing paper, coated art paper

Huatai Group is one of the China Top 500 enterprises that mainly manufactures paper and chemical products and specializes in printing, thermal electricity, logistics, forestry and real estate. It's the biggest high-grade newsprint manufacture base in the world, with over 15,000 employees, total assets of 32 billion yuan and paper capacity of about 4 million tons/a.

Performance in 2016:

Main business income: CNY 66.7 billion

Paper and board output: 3.19 million tons

Profit and tax: CNY 6.67 billion

Profit : CNY 3.38 billion

Highlights:

★Huatai cooperated with Stora Enso in coated art paper production, and Suzhou Zixing's SPCO brand



Li Jianhua, chairman



Juha Sipila(third from the left), Prime Minister of Finland, was present on the signing ceremony between Huatai and Finland North Biochemistry.

was transferred to Huatai.

★The upgrading of five newsprint production lines has been completed, which initiated Huatai's operation model of "Newsprint plus Intelligent Manufacture".

Recent news:

★Huatai established business relations with Finland North Biochemistry, and the prime minister of Finland was present on the ceremony.

★Huatai established comprehensive cooperation relations with Agricultural Bank of China.



Nine Dragons Paper (Holdings) Limited

Headquarter: Dongguan, Guangdong Province

Major products: packaging paperboard, printing & writing paper, specialty paper



Cheung Yan, chairlady

Nine Dragons Paper is the world's largest modern packaging board manufacturer based on recycled paper. Major production bases are located in Dongguan, Taicang, Chongqing, Tianjin, Quanzhou, Shenyang and Vietnam. The production capacity of Nine Dragon has exceeded 14 million tons and the business income added up to over 10 billion yuan totally.

Performance in 2016:

Main business income: CNY 48.7 billion

Paper and board output: 13.31 million tons

Highlights:

★Nominated in “China’s Top 10 Paper Manufacturing Enterprises” and “China’s Top 100 Enterprises in Light Industry”.

Recent news:

★May 2017, Cheung Yan, the leader of ND Paper, was once again selected by RISI as “Asia’s Best CEO”.



CPPIA Members in 2017 Top20
(CPPIA: China Pulp & Paper Int'l Alliance)



Shandong Sun Paper Industry Joint Stock Co., Ltd.

Headquarter: Yanzhou, Shandong Province

Major products: high-grade coated packaging board, coated art paper, writing and printing paper, special fiber dissolving pulp, tissue, industrial packaging paper

Founded in 1982, Sun Paper is a leading enterprise in China paper industry. Listed in the Shenzhen Stock Exchange from 2006, Sun Paper performs well as one of the global top 50 paper manufacturers and China top 500 enterprises. The pulp and paper production capacity exceeds 6 million tons/a, and it's economic performance maintains the leading position for years.

Performance in 2016:

Main business income: CNY 44.2 billion

Paper and board output: 4.98 million tons

Highlights:

- ★Sun Paper signed strategic cooperation agreement with Japan Creca.
- ★The biomass refinery project with capacity of 0.70 million tons was put into operation in the United States.
- ★Low-weight kraft board project of 500 thousand tons/a was put into

operation.

Recent news:

- ★The LBKP project, with capacity of 0.30 million tons in Muang Phin, Savannakhét, Laos, was put into operation.
- ★Sun Paper was nominated in the list of “Global Top50 Paper Manufacturers” for the first time.
- ★Reconstruction and supporting project for high-grade paper board was initiated with annual production capacity of 800 thousand tons.



Li Hongxin, chairman





Shandong Tranlin Paper Co., Ltd.

Headquarter: Gaotang, Shandong Province

Major products: unbleached fine paper, unbleached tissue, unbleached food packaging box, humic acid fertilizer



Li Hongfa, chairman

Shandong Tranlin Paper Co., Ltd. is a leading straw utilization paper enterprise that mainly manufactures unbleached paper products and fulvic acid fertilizers by straw. Equipped with a state-level technology center, Tranlin has been honored the “National Innovation Pilot Enterprise” and “National Top10 Paper Manufacturers”.

Performance in 2016:

Main business income: CNY 14.67 billion

Paper and board output: 0.93 million tons

Profit and tax: CNY 1.54 billion

Profits: CNY 1.25 billion

Highlights:

★Tranlin’s technology of straw pulping and recycling utilization of black liquor has been listed in the *Low-carbon Technologies Promoting Catalog* by National Development and Reform Commission, the top economic planner in China.

Recent news:

★Li Hongfa, the GM of Tranlin, was awarded the “2nd Outstanding Engineer”.

★Tranlin(Heilongjiang)’s first phase of straw converting project has been put into operation, including straw processing(600 thousand tons/a), the production of unbleached straw pulp(200 thousand tons/a), unbleached tissue(200 thousand tons/a), organic fertilizers(300 thousand tons/a), and supporting generating units(80,000kW).





Shandong Century Sunshine Paper Group Company Limited

Headquarter: Changle, Shandong Province

Major products: white top testliner, coated linerboard, paper tube, pre-printing materials



Wang Dongxing,
chairman

Shandong Century Sunshine Paper Group Company Limited has total assets of 10 billion yuan and paper production capacity of 1.3 million tons. With unique product positioning and differentiated business strategy, Sunshine Paper has extended the sales network to over 30 nations and areas. And it has been recognized as the leader in the packaging paper and board segment, and the outstanding manufacturer for coated and uncoated white top testliner.

Performance in 2016:

Main business income: CNY 6

billion

Paper and board output: 1.25 million tons

Highlights:

★SRM project was put into operation.

Future plan:

Sunshine Paper aims to set up an “Internet plus paper packaging” platform. To speed up the steps of transfer, restructure and innovation, Sunshine Paper implemented its new concept of “one stop” packaging solution from paper, graphic design, printing, packaging production and delivery.





Development Goals of China Paper Industry by 2020

● China Paper Association

China Paper Association released the *Proposals for the Development of China Paper Industry during the National 13th Five-Year Plan[1]* in June 2017, and put forward future expectations for the development of China paper industry by the end of 2020.

1. Scale

By the end of 2020, the total consumption of China paper and paperboard is predicted to be 111 million tons, with an annual increase rate of 1.4%; per capita annual consumption is predicted to be 81kg, risen by 5kg compared with that of 2015; the newly founded, expanded and upgraded capacity of paper and paperboard will be 16 million tons(containing the eliminated capacity of 8

million tons); the total production capacity of paper and paperboard is expected to be about 136 million tons, while the total output is expected to be 115.55 million tons, with an annual increase of 1.5%, according to the report by China Paper Association.

2. Production structure of pulp

By 2020, wood pulp, wastepaper pulp and non-wood pulp is predicted to take up 28.6%, 65.0% and 6.4% respectively in all the pulp series, compared to the proportion of 27.9%, 65.1% and 7.0% in 2015. The proportion of domestic wood pulp is expected to reach 10.5% (risen from 9.8% in 2015), and the China's Forest-Pulp-and-Paper Integration Project is further advanced. The proportion of wastepaper pulp will maintain at 65%, the consumption volume will rise by 6.7 million tons, and recycled wastepaper will increase by 7.5 million tons. In addition, the output of non-wood pulp will maintain at the level of 6 million tons in total.

3. Resources consumption & pollutant emission reduction

China paper industry will play an essential role and help achieve the general development goals in the China's 13th Five-Year Plan. By 2020, the water consumption per 10 thousand GDP will reduce by 23%; energy consumption per unit of GDP will reduce by 15%; chemical oxygen demand of pollutant and emission volume of ammonia and nitrogen will decrease by 10%; and the total emission volume of sulfur dioxide and nitrogen oxide will decrease by 15%, according to the general development goals of the whole society.

Notes

[1]13th Five-Year Plan: China's Five-Year Plans are a series of social and economic development initiatives. In order to more accurately reflect China's social and economic development in a certain period, a five-year plan will be made for every five years by Chinese government. The period of the national 13th five-year plan is from 2016 to 2020.



China Import Ban on Unsorted Foreign Wastepaper From 2018

General office of the State Council of the People's Republic of China has recently released the *Ban on Imported Waste ---the Implementation Plan for Imported Solid Waste Management Institution*, according to which the importation of highly polluting solid waste will be forbidden by the end of 2017 for the purpose of protecting China environmental interests and people's health. The import of the solid waste that can be replaced by domestic one will also be gradually forbidden by the end of 2019. The items related to paper industry are as follows.

- Adjusting the imported solid waste list by proper classification, reducing the categories and quantity of the imported solid waste gradually and systematically, and prohibiting to import the unsorted wastepaper by the end of 2017.
- Improving the quality requirement of imported solid waste and the environmental protection and pollution control standards, and raising the scale requirement of the processing and utilization enterprises of imported wastepaper.
- Further improving the laws, related regulations and the licensing system for imported solid waste, and canceling the trading import agent.
- Strengthening the supervision, and punishing waste smuggling and the illegal utilization of wastepaper severely.

(via Ministry of Environmental Protection of China)

Related info.

Ministry of Environmental Protection of China has recently notified the World Trade Organization(WTO) about a ban on the importation of certain solid waste, which will take effect at the end of 2017.

At the same time, Standardization Administration of China also submitted the *Solid Waste Identification Standard* to WTO.

There are two categories of wastepaper mentioned in the Standard. The first category (Customs tariff code: 4707900090) is called “other recycled paper and paperboard (including unsorted waste and scrap)” or mixed wastepaper; the second category (Customs tariff code: 4707900010) is called “recycled waste wallpaper, wax paper, and copy paper(including unsorted waste and scrap)”, consisting of waste carbonless copy paper, thermo-sensitive paper paper, water proof paper, non-dry adhesive paper, oiled paper and used liquid wrapping paper(tetra pack).

In 2016, China has imported about 5.69 million tons wastepaper in the first category, among which the price is 149 US dollars per ton from America, and 190 US dollars per ton from Japan, according to the statistics from China Customs.

Innovative achievements of China pulp and paper independently developed facilities (II)

Technologies for Pulping Facilities

● Zhang Hongcheng, Chen Yonglin

Nowadays, China pulping equipment is developing towards the direction of low energy consumption and pollution, high efficiency and productivity, automation and multi-function. And great progress has been achieved in clean pulping, scale production, energy conservation and emission reduction, mechanical-electrical integration, integration of production lines, reliability and stability of equipment. Some representative achievements of pulping equipment are listed below.

1. Straw-based clean pulping technology

The straw-based clean pulping technology, developed by Shandong Tranlin Paper, is composed of five aspects, including hammer-type material preparation, displacement cooking, mechanical defiberation plus oxygen delignification, unbleached pulp production, and organic fertilizers making by waste liquor.

The core of the new technology is to improve the quality of straw fiber and achieve the minimum discharge and recycling utilization of waste liquor

through efficient stock preparation and continuous cooking. Firstly, the adoption of straw crusher rather than straw cutter could realize effective defiberation of straw and promote efficient removal of waste residues. Secondly, displacement cooking technology could effectively reduce the viscosity of black liquor, raise the extraction ratio of black liquor and reduce the water and energy consumption. Afterwards, the pulp yield can be increased from 40%~50% to 55%~60%, and extraction rate of black liquor can be increased by 5%~10%. The 400m³ vertical digester was developed based on the 135m³ straw replacement digester. Thirdly, the continuous digester could realize the automatic control and scale production, thus making the productive capacity of single line up to 100~200 thousand t/a. Fourthly, the lignin produced in pulping can be used to make organic fertilizers. Based on some research work, the wheat bran collected in stock preparation is transformed to fuel ethanol, and the waste residues are made into organic fertilizers.

In addition, the non-wood fiber horizontal tubular

continuous cooking system developed by China enterprises has ascended to be the first-class globally. With good coordination of equipment and high automation, this system has acquired wide application in bagasse and reed pulping.

2. Twin roll press

Twin roll press has expanded its market share in China gradually compared with the vacuum washer and twin wire press filter. The popularity is owing to its newly added displacement function based on the press function, which effectively reduced water consumption of pulp per ton, cut down the COD concentration and improved the washing efficiency, washing quality and productive capacity. Twin roll press is classified as pressurized pulp distribution and screw pulp distribution based on their structure.

The SJA2272 and SJA2284 displacement twin roll

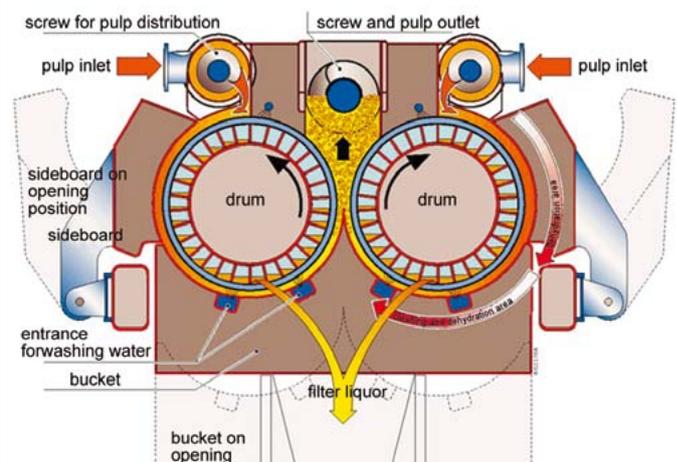


Vertical continuous digester in Shandong Tranlin Paper

press developed by Wenrui Machinery adopted pressurized baffle distribution, which has been close to the international advanced level in the aspects of capability, operating stability, energy consumption and effectiveness. This newly updated twin roll press has the advantage of high automation, easy handling, reliable operation, large productive capacity, high outlet pulp consistency, low operation cost, low investment, relatively smaller space demand, low water consumption, and implementation simplicity for artificial intelligence. Suitable for both straw pulp and wood pulp, this equipment can be applied to black liquor extraction, and bleached pulp washing and concentration. The designed productive capacity can be up to 4000~4500ADt/d when it's applied in kraft pulping system.

3. Closed screening system

The closed screening system developed by Shandong Jiefeng is characterized with water saving, energy saving and fiber loss reduction. The screening system is a kind of outflow medium consistency pressure screen which is equipped with closed rotor and slot drum. The slot width of first stage screen is 0.2~0.25mm and that of second stage is 0.3mm. This new type screen can



Twin roll press with screw pulp distribution

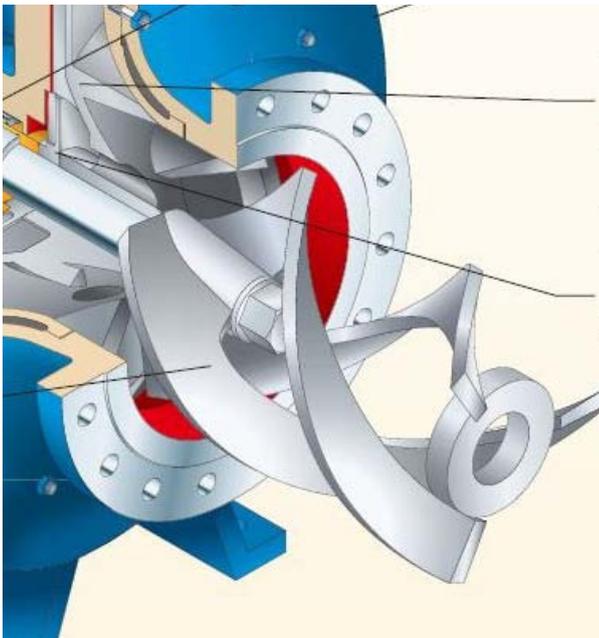
▶ Technology



SJA twin roll press by Wenrui Machinery(Shandong) Co., Ltd.



Energy-saving pressure screen by Shandong Jiefeng Machinery Co., Ltd



Turbulence generator with spiral blade

support the production scale of 300~450t/d. The screen equipped with the wave shaped drum and the low-pulse pressure screen equipped with bar structure drum are realized into serialization, the manufacture level of which have been closed to the advanced level in the world.

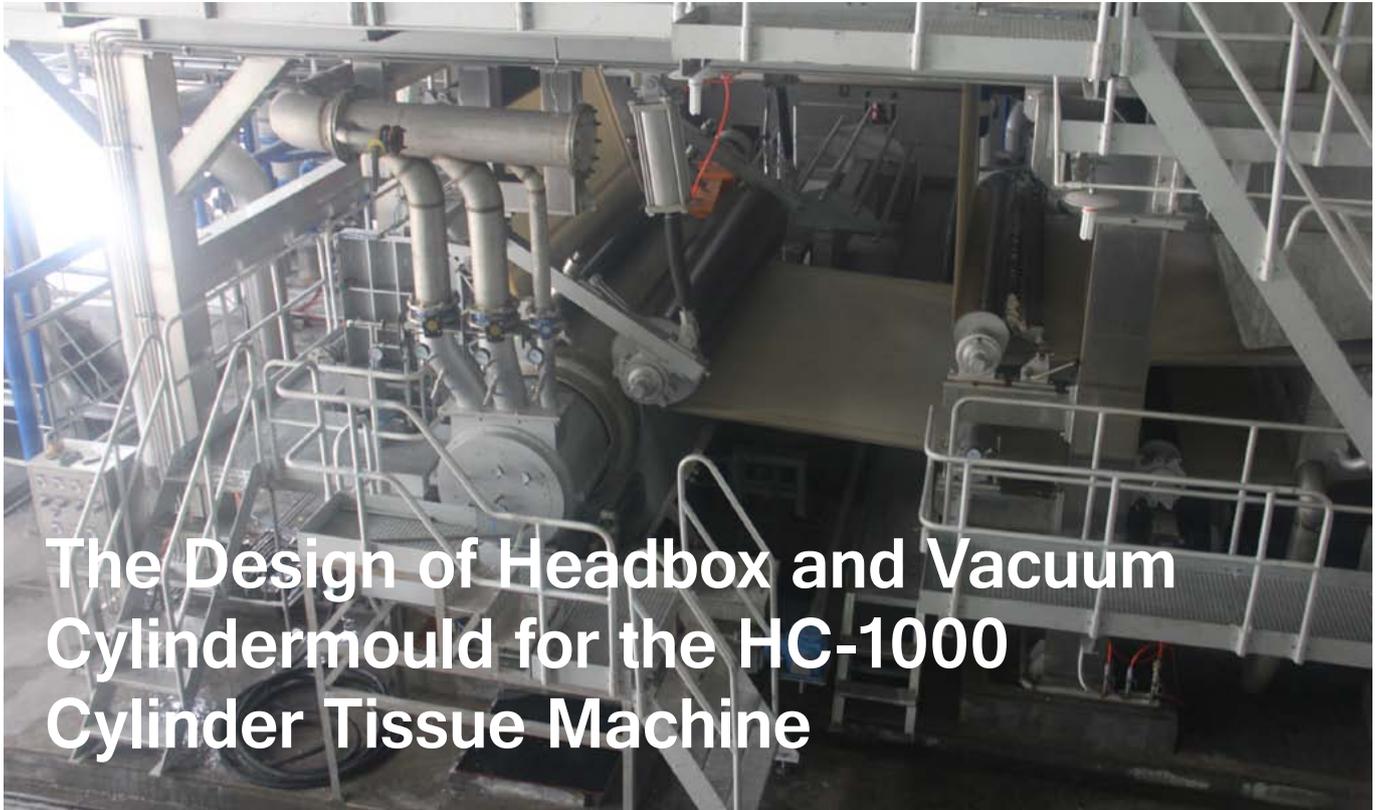
4. Medium consistency bleaching system

Continuous, large-scale and ECF & TCF bleaching systems are the developing trends of the bleaching system developed by China in recent years. The medium consistency bleaching integration equipment independently developed by China mainly includes two-stage oxygen delignification and H₂O₂ bleaching device, and the supporting medium consistency pumps and high consistency high shear mixer.

One of the representative manufacturers is Wenrui Machinery, whose key facilities and systematic integration for medium consistency ECF oxygen delignification and multi-stage bleaching with a productive capacity of 20-100t/a, cost only a half compared with imported ones.

HMEI Machinery & Engineering Co. has developed a kind of medium consistency pulp pump with high performance and high-lift of delivery(100-140m). The turbulence generator and centrifugal impeller of the pump are installed in an integrated structure but manufactured separately.

Next issue: Innovative achievements of China pulp and paper independently developed facilities (III): Technologies for papermaking facilities



The Design of Headbox and Vacuum Cylindermould for the HC-1000 Cylinder Tissue Machine

✪ Meng Fancun, Feng Shujun
(Weifang Hicredit Machinery Co., Ltd.)

1. Specification

Paper species: household paper (facial tissue, toilet paper, etc.)

Width: 2850mm

Pulp composition: 30%-40% long fiber, 70%-60% short fiber

Basis weight: 13-25g/m²

Designed speed: 1100m/min

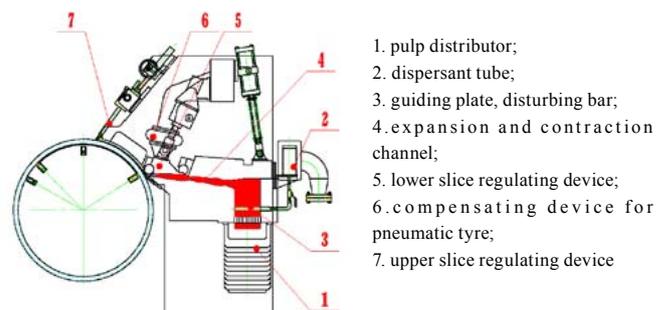
Operating speed: 1000m/min

2 Structure and features

2.1 Hydraulic headbox

Figure 1 is the hydraulic headbox for HC-1000 cylinder tissue machine. The headbox adopts single-side entry conical tube for pulp slurry distribution. The conical distributor is mainly composed of transition tube,

conical tube and pore plate. The transition tube is properly designed into a constant length to eliminate the unstable pressure from the pressure screen and ensure the even distribution of pulp slurry. The conical tube is shaped as a rectangle one, which could also promote the even distribution of slurry flow. A



1. pulp distributor;
2. dispersant tube;
3. guiding plate, disturbing bar;
4. expansion and contraction channel;
5. lower slice regulating device;
6. compensating device for pneumatic tyre;
7. upper slice regulating device

Figure 1 Scheme of Hydraulic Headbox

Technology

backflow is designed on the end of the conical tube to guarantee the pressure stability and even distribution of slurry flow, and also to eliminate bubbles in the end of the tube. The low backflow (5%) could help to reduce energy consumption of fan pumps. The pore plate is made from polymethyl methacrylate, and the pulp-entry side of it is designed to be saw tooth shape to prevent fiber retention on hole edges.

According to isobaric principle, the dispersant tube is also designed to be conical type to ensure the even addition of dispersants and reduce the dosage of it. The disturbing bar is hollow, with some holes on the upper side. The dispersant can be added to mix with slurry from the holes of the disturbing bar, and the action of guide plate could also promote further mixture of dispersant and slurry.

The mixed slurry flow enters the flow passage where the slurry flow can be adjusted to become even flow along the cross profile through contraction, expansion, acceleration and deceleration. The pressure detector

is installed in the side end surface. The frequency of fan pumps was regulated according to its pressure data (pressure should be consistent with pump).

The adjusting device of lower slice is composed of upper lip board and lower lip board. The backflow can be designed on both sides of the lower lip board, which could help to adjust the MD/CD tensile ratio and the basis weight of the two edges of paper sheet. The adjusting device of upper slice is composed of arc board and fine adjustment device.

2.2 Suction cylinder mould

As can be seen in Figure 2 and Figure 3, the shell of cylinder mould is a roll made of stainless steel on which shouldered holes are distributed evenly.

The vacuum box is divided by sealing strips into three vacuum chambers: first vacuum chamber, second vacuum chamber and third vacuum chamber. The axial sealing strip is forced onto the inner face of the shell by a pressurized tyre, and the end sealing strip is sealed by the pressure of spring. For the purpose of lubrication, a water jet is installed to supply water for the area between sealing strips and inner face of shell. The sealing strip is made of graphite rubber, which is wear resistant material and has a long lifetime, thus reducing the downtime of paper machines. A worm gear is equipped with the box for the adjustment for the position of suction area.

Higher hole area rate on the vacuum cylinder mould improved the dehydration efficiency, expanded the water-holding space, and greatly reduced the friction force of dehydration. For the purpose of higher operating speed, the two layers of stainless steel wire are designed to improve the retention rate of fiber, reduce the fiber loss, and increase the dehydration efficiency and sheet dryness by pressure and suction.

In a word, the HC-1000 cylinder tissue machine has reached the designed targets in the practical operation, which stands for the advanced manufacture level for the tissue paper machine made by China.

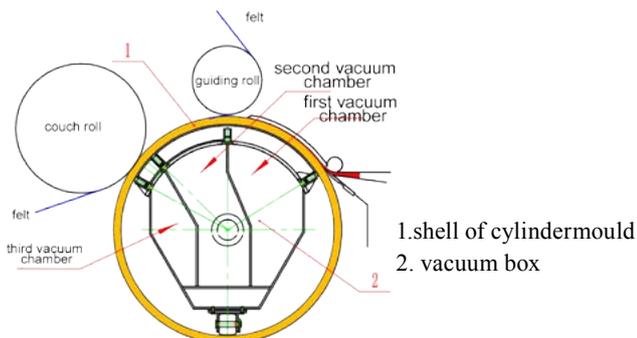


Figure 2 Section View of Suction Cylinder Mould

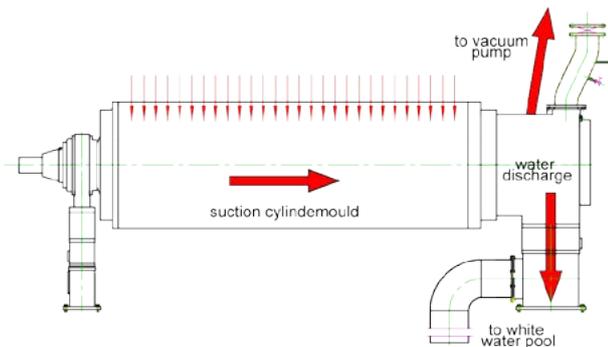


Figure 3 Working Principle of Suction Cylinder Mould

Application of the UMIC Anaerobic Reactor in Wastewater Treatment of Pulp and Paper Industry

● Wang Aiyuan (Huazhang Technology Holdings Limited)
Nie Wei (Guangxi Lvchen Environment Engineering Co., Ltd.)

Anaerobic wastewater treatment is a kind of environmentally friendly treatment technology compared with other treatment technologies. With lower costs and higher effectiveness, good results have been achieved in the treatment of high concentration organic wastewater.

The third generation IC anaerobic reactor is the most widely applied now in wastewater treatment, but some problems have occurred in the process of application. Firstly, large quantity of granular sludge is required in the initial start-up of the reactor, which increased the treating costs; secondly, anaerobic granular sludge is easy to run off, and the supplement of it required additional cost; thirdly, the efficiency of the anaerobic reactor will be decreased once the anaerobic granular sludge is calcified, and the supplement of granular sludge once again increases the operation costs. To solve the problems occurred in the third generation IC anaerobic reactor, the fourth generation UMIC anaerobic reactor has been developed.

Great progress has been achieved in the application

of UMIC anaerobic reactors. For example, Zhejiang Jingxing Paper JSC Ltd., with the productive capacity of 1.3 million t/a, is a paper enterprise that mainly manufactures kraft liner board and high-strength corrugated medium with wastepaper. It has adopted IC anaerobic reactor made by a well-known machinery supplier and a German R2S anaerobic reactor successively. However, loss and calcification of sludge frequently occurred in the operation, because of which anaerobic granular sludge needs to be added every year. After the adoption of the UMIC anaerobic reactor supplied by Guangxi Lvchen Environment Engineering Co., Ltd., Jingxing could be able to carry out 150~200tons of anaerobic granular sludge every month for sale. The COD of anaerobic effluent was reduced to a large extent, setting up a solid foundation for the aerobic reaction and deep converting afterwards.

In a word, the UMIC anaerobic reactor has good removal efficiency of COD with a bright prospect for future application.

Table 1 Differences between UMIC and IC Anaerobic Reactors

Indicators	The 3rd generation IC anaerobic reactor	The 4th generation UMIC anaerobic reactor
Structure	There are two UASB reaction chambers, including upper and lower ones. The methane gas separation can be divided into two steps throughout the reactor. The gas collected in the first step could rise to form the internal circulating flow, so this reactor can also be called “internal circulating reactor”. It’s featured by fast flowing speed, recovery of non-flocculent sludge, and sludge granulation.	The UMIC anaerobic reactor, upgraded from the IC reactor, has a properly designed flowing speed with the recovery device of flocculent sludge. It could be started with flocculent sludge in the first run And long-term operation could granulate the flocculent sludge.
Loading volume	Maximum 35 kgCOD/ m ³ •d	Maximum 35 kgCOD/ m ³ •d
Sludge used in the first run	The granular sludge required for the first start-up takes up 50% of the reactor volume. This kind of sludge is expensive and difficult to collect.	Anaerobic granular sludge or common flocculent sludge can be used in the first start-up. The flocculent sludge is easy to collect and of low price.
Sludge losing	It’s easy for sludge to run off, and supplement of granular sludge is demanded.	It’s not easy for sludge to run off.
Granular sludge emerging	Yes	Yes
Sludge calcification	Yes, and granular sludge supplement is required in time after calcification.	No
Alkali addition	More	Less
Tolerance of toxic inhibition	High	High
Resistance to overload shock	High	High
Maintenance	Infrequently	Infrequently
Recycled by-products	Anaerobic granular sludge and methane.	Anaerobic granular sludge and methane.
Blocking of water-entry distributor	Yes	No
Uniformity of water distribution	Relatively low	Relatively high

Table 2 Operating Data of the UMIC Anaerobic Reactor

Items	Unit	Figure
Flowing quantity	m ³ /h	370
Methane output	m ³ /d	14,180
COD of primary sedimentation tank	mg/l	5,400
COD of UMIC anaerobic effluent	mg/l	600~750
COD removal ratio	%	86
Volatile fatty acid of anaerobic effluent	mmol/l	0.6



China Paper and Paperboard Output and Consumption

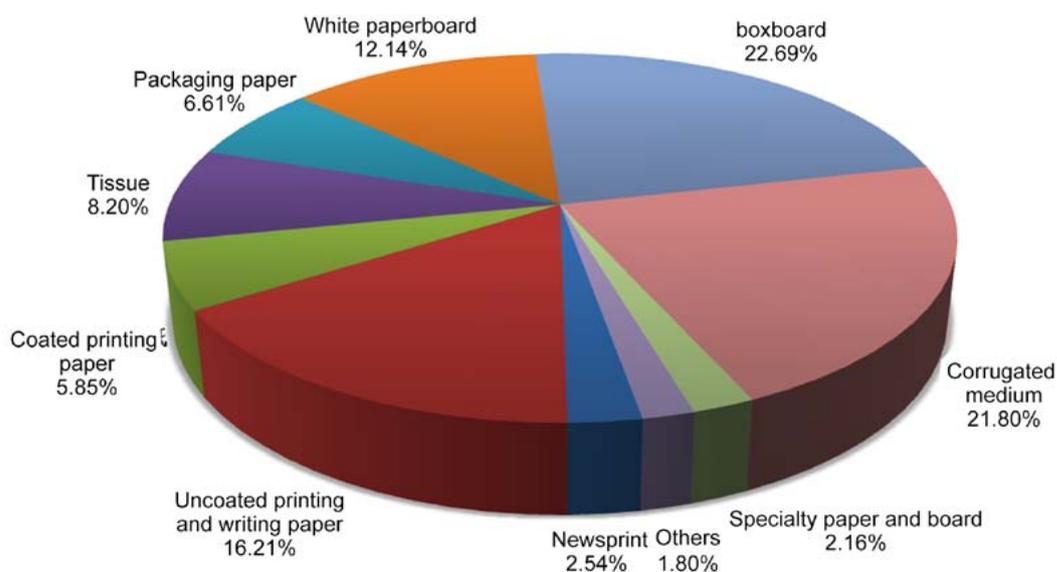
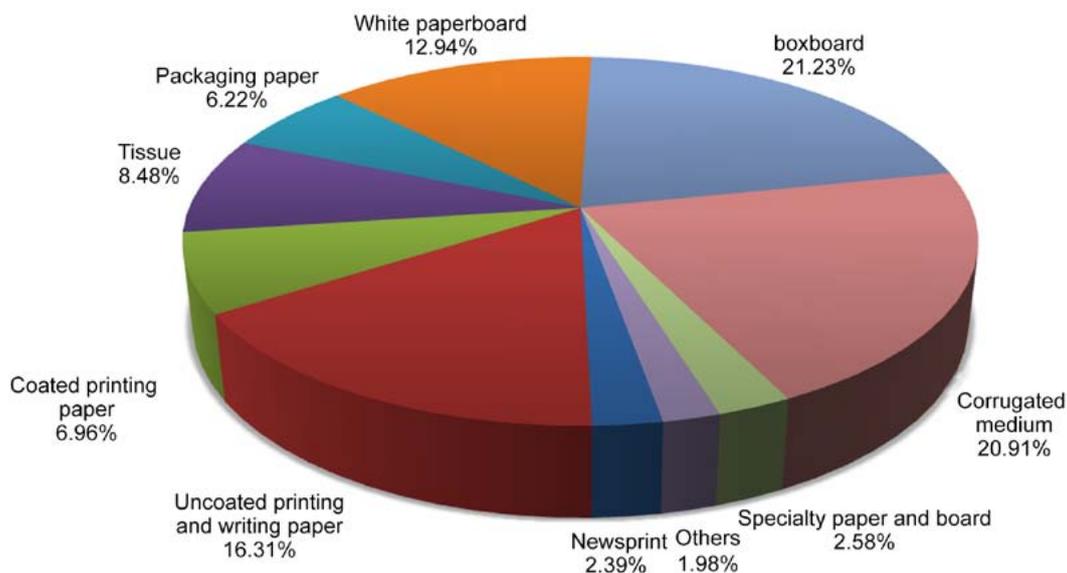
 China Paper Association

In 2016, the total output of paper and paperboard in China turned out to be 108.55 million tons, grown by 1.35% compared with that of 2015; the total consumption was 104.19 million tons, increased by 0.65%; per capita consumption volume was 75kg (1.38 billion people nationwide), according to the survey by China Paper Association (Table 1). The proportions that different paper species accounted for in the total output and consumption volume of paper and paperboard in 2016 are shown in Figure 1 and Figure 2 below.

Table 1 China Paper and Paperboard Output and Consumption

Paper species	Output/thousand tons			Consumption/thousand tons		
	2015	2016	YoY(%)	2015	2016	YoY(%)
Total	107,100	108,550	1.35	103,520	104,190	0.65
1. Newsprint	2,950	2,600	-11.86	2,990	2,650	-11.37
2. Uncoated printing and writing paper	17,450	17,700	1.43	16,800	16,890	0.54
3. Coated printing paper (Art paper)	7,700	7,550	-1.95	6,420	6,090	-5.14
4. Tissue	8,850	9,200	3.95	8,170	8,540	4.53
5. Packaging paper	6,650	6,750	1.50	6,810	6,890	1.17
6. White paperboard (Coated white paperboard)	14,000	14,050	0.36	12,990	12,650	-2.62
7. Boxboard	22,450	23,050	2.67	22,970	23,640	2.92
8. Corrugated medium	22,250	22,700	2.02	22,280	22,710	1.93
9. Specialty paper and board	2,650	2,800	5.66	2,170	2,250	3.69
10. Others	2,150	2,150	0.00	1,920	1,880	-2.08

► Statistics



Outstanding enterprises display

Front cover/ China Pulp & Paper International Alliance(CPPIA)
 Inside front cover/ Shandong Xinhe paper-making Engineering Co., Ltd.
 Inside back cover/ Wenrui Machinery (Shandong) Co., Ltd.
 Back cover/ Anhui Taipingyang Special Fabrics Co., Ltd.
 33/ Shashi Light Ind. Machinery Co., Ltd.
 34/ Shandong Chenzhong Machinery Co., Ltd.
 35/ Shanghai Qingliang Industry Co., Ltd

36/ Sichuan VANOVA Technical Fabrics Co., Ltd.
 37/ Yingde Liangshi Industrial Materials Co., Ltd.
 38/ Weifang Hicredit Machinery Co., Ltd
 39/ Huazhang Technology Holding Limited
 40/ Shandong Sinolion Machinery Corp. Ltd
 41/ Tengzhou Lihua Mitex Elastomer Roller Co., Ltd
 42/ CPPIA
 44/ Tianli Machine Building Co., Ltd.

Output of Chinese Leading Paper Manufacturers

 China Paper Association

There were about 2,800 paper and paperboard manufacturers in China, which brought out a total output of 108.55 million tons of paper and paperboard in 2016, according to the survey by China Paper Association. The output of China top 30 paper manufacturers is listed in Table1 below.

Table 1 Output of China Top 30 Paper Manufacturers

S/N	Company	Output/thousand tons		
		2015	2016	YoY(%)
1	Nine Dragons Paper(Holdings)Limited	12, 630	13, 310	5.38
2	Lee & Man Paper Manufacturing Limited	5, 195	5, 431	4.56
3	Shandong Chenming Paper Group Co. , Ltd.	4, 180	4, 426	5.87
4	Shandong Sun paper Industry Joint Stock Co., Ltd.	3, 139	3, 789	20.72
5	Anhui Shanying International Holdings Co., Ltd.	2, 940	3, 540	20.41
6	Huatai Group Co., Ltd.	3, 080	3, 187	3.46
7	Fujian Liansheng Paper Co., Ltd.	2, 320	2, 350	1.29
8	China Paper Corporation	2, 221	2, 340	5.36
9	Ningbo Zhonghua Paper Co.,Ltd.(Ningbo Asia Pulp and Paper Co., Ltd.)	1, 993	2, 239	12.34
10	Gold East Paper (Jiangsu) Co., Ltd.	2, 034	2, 077	2.14
11	Shandong Bohui Paper Group Co., Ltd.	1, 810	1, 979	9.31
12	Jiangsu Longchen Greentech Co., Ltd.	1, 608	1, 895	17.84
13	Dongguan Jianhui Paper Co., Ltd	1, 354	1, 430	5.59
14	Zhejiang Jingxing Paper JSC Ltd	1, 231	1, 310	6.41
15	Gold HongYe Paper Group Co., Ltd.	1, 237	1, 293	4.59
16	Shandong Century Sunshine Paper Group Co., Ltd.	1, 138	1, 246	9.51
17	Hainan Jinhai Pulp & Paper Co., Ltd.	1, 077	1, 089	1.08
18	Dongguan Jinzhou Paper Co., Ltd.	853	1, 059	24.21
19	UPM (China)	895	1, 000	11.73
20	Shandong Tranlin Paper Co.Ltd.	774	931	20.28
21	Zhejiang Yongzheng Holding Co.Ltd.	1, 056	839	-20.54
22	Xinxiang Xinya Paper Group Co., Ltd.	686	759	10.60
23	Wuhan Golden Phoenix Paper Co., Ltd.	473	732	54.80
24.	Zhejiang Xinshengda Holding Group Co., Ltd.		710	
25.	Gold Huasheng Paper (Suzhou Industrial Park) Co., Ltd.	628	626	-0.32
26	Dahe Paper Co., Ltd.	620	593	-4.32
27	Shandong Guihe Xianxing Paper Industry Co.,Ltd.	558	576	3.15
28	Guangzhou Paper Group Ltd.	535	505	-5.61
29	Shandong Henglian Investment Co., Ltd.	418	503	20.46
30	Asia Symbol (Guangdong) Paper Co., Ltd.	492	500	1.63

Note: The list was ranked according to the statistics that has been collected.

Nine Dragons Paper: Total capacity of 16 million tons/a to be accomplished by 2018, with Vietnam mill under built

Nine Dragons Paper (Holdings) Limited continues to increase the production capacity in order to consolidate its leading position in China paper market. Kraft board capacity will be further increased by 2.35 million tons with the newly planned projects in Fujian(0.35 million tons), Chongqing(0.55 million tons) and Hebei(0.5 million tons), along with the Vietnam factory(0.35 million tons) and Shenyang factory(0.6 million tons) under construction. With an allocation of 9.3 billion yuan, these newly added capacity is predicted to be put into operation in Q4, 2017 and

Nine Dragons' overall production capacity will hit over 16 million tons/a by the end of 2018.

Nine Dragons Paper (Quanzhou) plans to carry out a high-end kraft board project with annual capacity of 2 million tons. The project phase I (0.65 million tons/a) has already been finished and put into operation. The project phase II (0.65 million tons/a) is under built now with allocation of about CNY 1.83 billion. Two wastepaper pulping lines will be built, including a kraft board production line (0.35 million tons) and a recycled kraft board production line(0.3 million tons).



Gold HongYe Paper: Capacity in China mainland totaled 1.64 million t/a, Indonesia becomes the next destination for further industrial increase

Gold HongYe Paper Group Co., Ltd., a subsidiary of APP, has realized tissue capacity of 1.64 million t/a in China mainland, along with APP's 1.06 million t/a tissue capacity in Indonesia, making App become the third largest tissue paper manufacturer in the world.

After the operation of high grade tissue project(0.12 million t/a) in Suining Sichuan base in 2016, Gold HongYe Paper also accelerated the construction of tissue project (0.12 million t/a) in

Ya'an Sichuan base which was carried out in two phases with the investment of 1.2 billion yuan in total.

Gold HongYe Paper, established by APP(China) in 1996, is a large-scale modern tissue manufacturer with manufacturing bases in Tianjin, Shenyang, Chengdu, etc. The further expansion of tissue projects will be transferred to Indonesia gradually.

Shanying Paper: The acquisition of Nordic Paper quickens its entry to high-end specialty paper market

Goldcup company (a Swedish branch of Anhui Shanying Paper Industry Co.,Ltd.) entered into an agreement in July 2017 with Holding Blanc Bleu 5 S.á.r.l(HBB) and Petek GmbH to acquire 100% of the shares in Nordic Paper Holding AB from HBB and Petek GmbH.



Shanying acquired 61.2% shares of Nordic Paper from HBB and

38.8%shares of Nordic Paper from Petek GmbH by 1.95 billion yuan, after which Shanying became the new owner of Nordic Paper. After the acquisition, Shanying will enter the high-end specialty paper market with high technical barriers and strong profitability.

China Paper Corporation: 0.7 million t/a pulp mill to be set up in Russia

A 0.7 million t/a pulp mill is planned to be jointly established by China Paper Corporation (a wholly-owned subsidiary of China Chengtong Holdings Group Ltd.) and Russian Forest Products Group(RFP)in Амýрск, Russia.

The new pulp mill is predicted to acquire over one billion U.S. dollars investment, and it's set up mainly for the manufacture of printing and writing paper and cardboard paper. Wood materials will be supplied by RFP, the biggest forestry enterprise in eastern Russia.

Chenming Group: Fine paper project with capacity of 0.51 million t/a is under construction

The fine paper machine(PM7) with annual capacity of 0.51 million tons is under construction now in Shouguang, Shandong Province. It's predicted to be put into operation in June, 2018.

Information

PM7 is supplied by Voith from Germany, with the web width of 10.5 meters, roll width of 9.85 meters, designed speed of 1800 m/min, working speed of 1700 m/min and basis weight of 60-140g/m². According to the agreement, Voith provides paper machine, roll delivery system and two sets of rewinders. The technologies of MasterJet



headbox, DuoFormer TQvII upright twin-wire former, and NipcoFlex shoe press could not only guarantee the paper quality, but also help to reduce the energy consumption.

Asia Symbol(Guangdong): PM12 with annual capacity of 0.45 million tons put into operation, making its fine paper capacity reach nearly a million tons in total.

PM12 production line, put into operation in early 2017 by Asia Symbol, is a high-grade fine paper project with annual capacity of 0.45 million tons. The paper machine in this project, utilizing whole production line supplied by Velmet from Finland, is one of the most advanced and fastest paper machines globally, with machine width of 9 meters and operation speed of 1800 m/min.

It's acknowledged that PM11 paper machine operated earlier, also with annual capacity of 0.45 million tons, has improved its annual capacity to 0.50 million tons through technology optimization. In 2017, Asia Symbol is expected to achieve the annual capacity of nearly a million tons of fine paper products with both PM11 and PM12 paper machines.

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● Dynamics of CPPIA members ●

CPPIA: China Pulp & Paper International Alliance

Four CPPIA Members Nominated in China Top30



China National Light Industry Council, the highest authority of China light industry, released the “Top30 Machinery Manufacturers of China Light Industry”, in which five pulp and paper machinery manufacturers were included. Notably, among these five shortlisted enterprises, there are four CPPIA members, including:

- Huazhang Technology Holding Limited
- Weifang Hicredit Machinery Co., Ltd
- Shandong Chenzhong Machinery Co., Ltd
- Shandong Changhua Papermaking Machinery Co., Ltd

Besides the four companies listed above, another one is Fujian Light Industry Machinery & Equipment Co., Ltd. All those five shortlisted enterprises are leading locomotives of China light industry machinery manufacturing industry.

The selection work of Top30 was carried out under the principle of improving competitiveness and comprehensive strength of China light industry enterprises, and the evaluation was performed according to a unified standard that consists of eight evaluation indicators, including business revenue, total profits, profit rate, revenue growth rate, R & D expenditure, number of patents, self-owned brand construction, and customer groups in 2016.

Sun Paper: Industry 4.0 project-0.8 million t/a high-grade paperboard project started

Shandong Sun Paper Industry Joint Stock Co., Ltd. initiated the establishment of 0.8 million t/a high-grade paperboard project, and the ground-breaking ceremony was held in Zoucheng(Jining city, Shandong province) manufacture base.

Industry 4.0 project will be carried out in the new production line where the high-grade

Information



paperboard to be produced, with NKP and AOCC pulp as its materials, is characterized by low basis weight, high ring crush compression resistance and wet strength, better water resistance and folding endurance performance, and recycling feature.

The project, with the allocation of 2.1 billion yuan (\$316.58 million dollars), is expected to achieve the sales revenue of 2.9 billion yuan per year. It's predicted that the project will make large profits in that the liner board demand

continues to rise because of the rapid development of online shopping and express delivery.

In 2016, the 0.5 million t/a low weight high-grade kraft board project was put into operation by Sun Paper. With the 0.8 million t/a project under construction, the kraft board productive capacity of Sun Paper will reach 1.6 million t/a by then.

Shashi Light Industry: Coating machine warmly welcomed in India

Shashi Light Ind. Machinery Co., Ltd. (SLMC), the specialist of coating and finishing equipment manufacturer & supplier in paper industry, is famous for its up-to-date products with better performance and relatively lower costs in the world market. In the past two years, SLMC has offered over twenty sets of coating machines for Indian paper mills, such as four sets of 3750/500 blade coaters for white board manufacture in Mehali Papers Private Limited, three sets of 3450/500 combined blade coaters for white board manufacture in JMC LTD, three sets of 3450/500 combined blade coaters for coated white board manufacture in Camerich Papers PVT LTD, the 5000/800 film transfer sizer for high-grade printing and writing paper manufacture in BINDAL Paper Limited, etc.



The blade coater developed by SLMC is distinctive in structure. Firstly, the thimble strip type coating head is easy to adjust and reset. Secondly, jet coating improves the flatness and uniformity of the coating layer, which enables it to adapt to higher operating speed. Thirdly, the AutoStop online coating control system could accurately adjust the gap between blade and back roll, making the remote control of coating weight (linked with DCS) fast and conveniently. Fourthly, back roll washing can be carried out online. Finally, the quick shift (15 minutes) of blade and measuring bar improves the efficiency and location accuracy greatly.

The newly developed EvenCurtain coating system is able to adapt to 880-6000mm width and 1200m/min operating speed, featured by optimized coating coverage, small coating backflow, low demand for base paper strength, and stable curtain. EvenCurtain could effectively solve the obstacles in the high solid content coating color, making it a potential coating technology that may be a replacement for traditional coating methods. Moreover, it will have a brighter application prospect in the manufacture of coated paper and paperboard, especially that of coated specialty paper.

Shandong Chenzhong: New breakthroughs made overseas

Shandong Chenzhong Machinery Co., Ltd has lately signed an agreement with Gap Con tissue S.r.l.(Italy) to supply high consistency defibrator for tobacco stem treatment, marking a new breakthrough made by Chenzhong Machinery in oversea tobacco market.

In addition, the whole set of pulping facilities ordered by Kavir Moghava Ardestan(Iran) for its 150t/d duplex grey paperboard project has been delivered by Chenzhong. Not only did Chenzhong provided not only the whole set of pulping equipment (from stock preparation line to approach system) and supporting equipment (such as pulp pump and water pump), but also the technical services for the design of pulping process and for the equipment lay-out and pipeline arrangement in the pulping plant.

What's more, a good result has been obtained in the first trial run of the whole set of pulping equipment (from stock preparation system to approach system) ordered by AL-SUWAIDI Paper Factory(Katar) for its 250t/d carton paper project. The running of the equipment is stable now, and the pulp manufactured proved to be superior in quality.

Wenrui: Suppling pulp washing machine for North America paper mills

Wenrui Machinery (Shandong) Co., Ltd. has supplied 11 sets of pulp washing equipment or upgrading services for five mills in North America, including Skookumchuck, Pictou and AV Nackawic, with its services covering pulp washer drum changing, roll change of twin-roll wash press, air doctor upgrading, etc.

For the low washing efficiency of the old equipment in North America, drums upgraded by Wenrui adopted completely new design of cone-shaped channel and corrugated filter plates. The pulp consistency over 12%, vacuum degree of 0.03MPa and daily productive capacity of 10



► Information

to 15t /m²(on wood pulp) could be achieved by the newly upgraded washer. The high washing efficiency helps the customers in chemicals saving and costs reduction, thus bringing better economic benefits.

In addition, mechanical engineers and consultants from Wenrui gave detailed guides towards the installation, start-up and commissioning for the purpose of deep understanding of new equipment by their customers. Reliable quality and good customer services of Wenrui have also set up a good reputation and laid a solid foundation for the future market expansion in North America.

Taipingyang Special Fabric: High strength flat yarn dryer fabric acquired widespread application

Anhui Taipingyang Special Fabric has newly promoted three kinds of dryer fabric series with high strength flat yarn, including high-speed intensive flat yarn dryer fabric, high-strength low air permeability flat yarn dryer fabric, and high-strength double warp flat yarn dryer fabric.

1. High-speed intensive flat yarn dryer fabric: Adopting a design of single warp 1.5-layer structure which is tough and gentle with higher air permeability and long service life, it can be mainly used in the drying part for packaging paper and specialty paper.

2. High-strength low air permeability flat yarn dryer fabric: With bigger contact surface and better discharge way of moisture evaporation, it's mainly used in the drying part for specialty paper, with the air permeability below 90CFM.

3. High-strength double warp flat yarn dryer fabric: Adopting a design of double warp weave, with high strength, good stability and super surface smoothness, it's mainly used in the drying part for printing & writing paper, technological paper and specialty paper.

At present, high strength flat yarn dryer fabric made by Taipingyang has been popularly used in the production line of specialty paper, printing & writing paper, packaging paper of Huatai Paper Co., Ltd., Chenming Paper Holdings Limited, Longchen Paper Co., Ltd., and other paper mills, and also has been exported to Brazil, Russia, Ukraine, Indonesia and partial countries in Southeast Asia. The fabric has the characteristics of smooth fabric surface, stable operation, stable quality, high anti-hydrolysis and top anti-pollution features with better performance-price ratio.



Wire plug work-shop



Wire interface press machine work-shop



Board Coating Machine



LWC Coating Machine



Film Press Sizer



Soft/Hard Crown Controlled Calender

Coating Finishing Equipment Manufacturing Base For Global Services – SLMC

China Shashi Light Ind. Machinery Co., Ltd. was founded in 1965. On the base of introduction technology from Germany and Finland, and with continuous self-innovation, SLMC has provided more than 500 sets of coating machines, soft/hard crown controlled calenders and film press sizers to the customers all over the world, representing the highest level of China coating finishing equipment.

SLMC has served more than twenty Indian customers, such as Bindal Paper Limit, etc.

The Name Of Customer	Specification Of Machine
Bindal Paper Limited	5000/800 film press sizer
Mehali Papers Private Limited	3750/500 four sets of blade coaters
Ruchira Papers Limited	3250/450 single nip hard calender
Silverton Pulp & Papers PVT. Ltd	3750/1000 drying oven, air turner

Shashi Light Ind.Machinery Co.,Ltd.

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Tel: +86-716-4314148

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Website:<http://www.slmc.com.cn/english.asp>

E-mail:scb-slmc@vip.163.com

Excellent equipment supplier
perfect stock preparation line solution

Information

As the excellent equipment supplier in China, Shandong Chenzhong Machinery Co.,Ltd.It was founded in 1954,with a long history of 63years until now. At present, we can provide 1000TPD of OCC pulp line,300TPD of DIP deinking pulp line,200 TPD of rice and wheat straw, bagasse pulp line and 70TPD bone dry sludge dewatering equipment project etc.We can provide technology consulting, complete line technology and equipment, pulp line modification and also can guide the equipment installation, commissioning, training, etc. We reach to provide perfect service for our customers.



SHANDONG CHENZHONG MACHINERY CO.,LTD

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FOREIGN TRADE MANAGER LI SHENJU:+008613583326209 smartlshj@aliyun.com
FOREIGN TRADE ASSISTANT LUCIA LI:+008613371581750 limingyinglucia@126.com

Production

Packaging Paper Machine

Paper Grade	Currgated paper, borad paper, Liner
Paper Width	3200mm~5600mm
Machine Speed	300m/min~1000m/min
Maximum Machine Production	100t/d~950t/d

Tissue Machine

Paper Grade	Tissue, Napkin, Kitchen tower
Paper Width	2850mm ~ 4100mm
Machine Speed	400m/min~1600m/min
Maximum Machine Production	40t/d~75t/d

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--using 4th generation new technology of PMC as the method to improve running efficiency and create new value for mainstream paper making machine



Company Induction

Sichuan VANOV Technical Fabrics Co., Ltd., is belonging to VANOV Group. Company engages in R&D, sales and production field. It owned "GOBEAR" & "VANOV" two famous brand, and is National high-tech enterprise, also passed ISO9001: 2008 national quality. We've achieved more than 50 newly and practical patents and inventions. Company devotes to afford clients paper making clothing with best quality, stable effect, professional service and environmental protection according to standardization, specialization, datamation. We service widely in all kinds of paper machine and PM speed. It recently has Chengdu Wenjiang and Shanghai Jinxiong two large production bases. Company devotes to be first class of PMC supplier in the world and uses 4th generation new technology of PMC as the method to improve running efficiency and create new value for mainstream paper making machine.

Product Introduction

◆ Twill Weaving Felt

Application to all kinds of packing/culture/special PM

Features: Angle exists between base fabrics, which cannot be compressed

Advantage: Perfect initial adaptability, stable space for containing water, consistent dewatering, enlarging felt service time, reduce PM running cost, promote PM running efficiency.

◆ Seam Felt

Application to packing/culture/pulp PM

Features: Seamed device on the machine, needless to move any roller of the PM and fixed supporting device

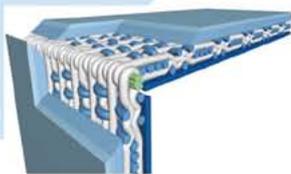
Advantage: the exchanging time of one piece felt can be controlled within 2 hours, which is much less than 4-6 hours of usual.

◆ Non-woven Felt

Application to all kinds of paper

Features: high elasticity, high smooth surface, high density, high ability to maintain caliper

Advantage: better initial adaptability, lower consumption of vacuum system, higher dryness of sheet, more stable property of PM running



We sincerely invite All Paper Mills and Agency to join us and accomplish win-win

Contact Person: Miss Lissa Email Address: trade@vanov.cn QQ: 10193323

Skype: lissa201432 Whatsapp: 008613438494475

SICHUAN VANOV TECHNICAL FABRICS CO., LTD. SHANGHAI JINXIONG FABRICS CO., LTD.

ADD: NO.519,SECTION II,XINHUA AVENUE,CHENGDU CROSS-STRAIT SCIENCE AND TECHNOLOGY INDUSTRIAL DEVELOPMENT PARK, WENJIANG DISTRICT.

Tel:+86-28-82782526 Fax: +86-28-82782615 Email:trade@vanov.cn Website:www.vanov.cn



QR Code:

Professional Solutions For Fine Chemicals in Paper Industry

Paper chemicals for packaging & printing paper

organic retention particles, multi-functional papermaking additives, cleaning chemicals, washing chemicals, defoamer, biocide, coating additives (AZC & PZC, PAPU, grinding dispersant, lubricant)
other chemicals: coating agent for LBP, surface sizing agent, starch enhancer, charge neutralization agent, antiseptic

Chemicals for tissue

creping agent, releasing agent, modifier, biocide, cleaning agent, felt cleaning agent, adhesive (tailed adhesive, paper tube adhesive, hot melt adhesive)
Other chemicals (softener, wet strength agent, dry strength agent, pitch control agent, papermaking defoamer)

Pulp chemicals

pulp defoamer, cooking additive, pitch control agent, scale inhibitor, binary bleach agent, H₂O₂ stabilizer, reducing bleach agent, pulp machine felt cleaning agent

Sewage treatment chemicals

flocculant, charge neutralization agent, mid-water defoamer, scale-inhibition and dispersion agent, corrosion inhibitor

Service Network: Guangdong, Shandong, Jiangsu, Zhejiang, Fujian, Hunan, Guangxi, Hainan, Sichuan, Chongqing, Shanghai, Jiangxi, Yunnan, and India.

Welcome to join us in our professional sales team!

Mr. Lai: +86-18607401339 lainandong@langshigy.com

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Tel: +86-20-82039849 Fax: +86-20-82568782 E-mail: sales@langshigy.com

PO: 513059 Network: www.langshigy.com

Address: Overseas Chinese Industrial Park, Donghua Town,
Yingde City, Qingyuan, Guangdong Province, China

Fine chemicals bring a healthy lifestyle.

Crescent Former Tissue Machine



Suction Cylinder Tissue Machine



Trimmed width:2660~5600mm

Machine speed:600~1000m/min

Basis weight:13~42g/m²



Double Wire Air Borne Drying Pulp Machine

Trimmed width:2400~6600 mm
Machine speed:50~250 m/min
Basis weight:600~1200 g/m²



High-speed Rewinder

Trimmed width:2640~7800 mm
Machine speed:1500~2500m/min



Huazhang Technology Holding Limited (hereinafter referred to as "Huazhang Technology") (Stock code:01673.HK) is a research and development, design, manufacturing, sales and provision for value-added service of automation system and solid-liquid separation processing products with a high-quality one-stop integrated service providers. The company has over 20 years experience in the automation systems industry, mainly serving the paper industry and gradually expands to the metallurgical, power, municipal and other industries. According to Euromonitor, a reputable market research firm, Huazhang technology have a leading market share in automation system in the paper industry in China and is competitive with other well-known multi-international enterprises. Huazhang have become one of the leading suppliers in automation system in the paper industry in China. The advantages of Huazhang Technology are strong in research and development and engineering teams with professional knowledge. Using our branding and unique patents and technologies, our strength is enhanced accordingly.



Business Scope:

Drive control system, MCS, MCC, DCS, Headbox, Wast water treatment system, Sludge dewatering machine, EPC project and Reject RDF.



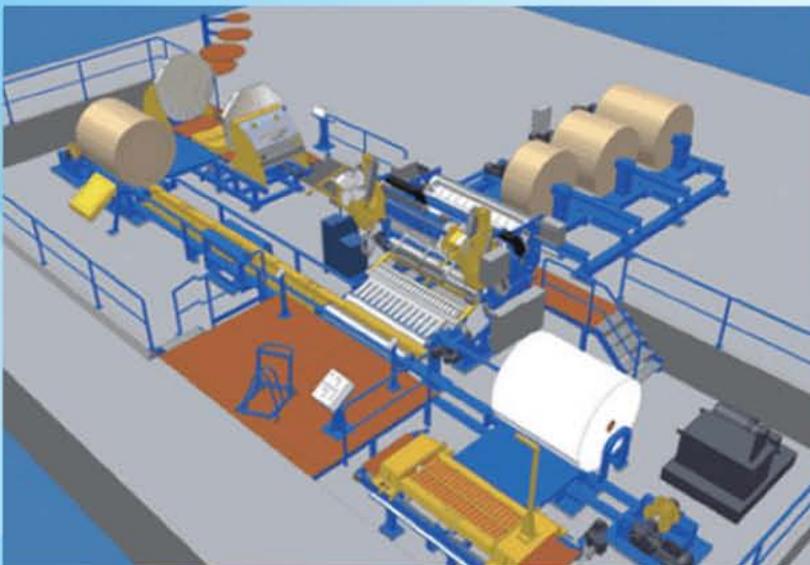
Huazhang Technology Holding Limited

Room 1101, 11/F, Block 2, Canal Advertising Industry Building, 99 Xiangyuan Road, Hangzhou, China.
Tel: 86—057188994499 Mobile: 86—13924056088 Fax: 86-057188994466,
E-mail: hzt@hzeg.com tony@hzeg.com Web: www.hzeg.com

Professional supplier of paper roll conveying & wrapping system

Sinolion machinery is professional in designing and manufacturing of paper conveyor and wrapping system. After re-winder, the whole latter-stage system includes the reel slitter, conveyor, scaling, date spray coding machine, wrapping machine and high-rise warehouse storage, etc. Our equipment has exported to Australia, Brazil, Singapore, Malaysia, the U.S.A., Canada, South Africa, etc.

The company has got the ISO 9001: 2015 certification and products are CE certified. We have raised the quality to high standard.



▶ Pallet Slat Conveyor



▶ Kicker



▶ Stopping Sorting Deck



▶ Turntable

- * Paper Roll Packing & Handling System
- * Sheet Paper Packing System
- * Stretch Wrapping System
- * Packaging Solution And Conveying System
- * High-rise Warehouse Storage



▶ Semi-auto Roll Stretch Wrapper



▶ Roll upender elevator

SHANDONG SINOLION MACHINERY CORP. LTD

Address: No. 2010 Kehang Road, High-tech Zone, Jinan, Shandong, China 250104 Fax: +86-531-88602653
Tel.: +86-531-88760971 / 88602653 E-mail: marketing@sinolion.cc Website: www.sinolion.cc



LIHUA

力华 — 胶辊专业制造商



Tengzhou Lihua Mitex Elastomer Roller Co., Ltd. has more than 30 years' experience in roller manufacture. Production base is located in Tengzhou city Shandong province and Huaqiao town in Kunshan city. Our rollers are used in the field of paper making, iron and steel and in some other industries. Our company can provide series services of R&D of new rollers, new roll bodies' manufacturing and repairing, covering, onsite service etc. Annual processing capacities of rollers reach to more than 10 thousand. On the new roll bodies' manufacturing, we chose cast iron, cast steel, steel profiles, stainless steel and other high quality materials. The manufacture process including processing, hot and cold assembly, heat treatment, crack detection, dynamic balance, inspection and so on. The max diameter can reach to 2m and the max length can reach to 12m. The covering materials including rubber, polyurethane, composite material and spraying. Our products are used in wire section, press section, applicator and coating section, soft calendar section and rewinding section of papermaking. Also used in cold rolled stainless steel annealing and pickling line, cold rolled carbon steel pickling line and color coated galvanized line of iron and steel industry and rolling, pickling, coating, straightening, cutting edge and other parts of nonferrous metal production line. Apply to the line pressure equal to or lower than 400KN/m; temperature of 300°C; wear resistant, acid and alkali; wide hardness range, good elasticity (ShA20~100°, ShD92°, P&J350~0°), using in high speed and harsh operating conditions of site. The company focuses on the customer's demand. With integrity, innovation of enterprise culture, exquisite processing technology, advanced equipment, efficient service team to meet domestic and foreign customer's demand; to create the most influential professional roller manufacturer.



Tengzhou Lihua Mitex Elastomer Roller Co., Ltd.

Address: Shandong province Su turbine north road no. 366

Fax: +86 632-5699275 E-mail: sdlihua@vip.163.com lihua@sdlihua.com

Tel: +86 632-5699450 5699298

Web: www.sdlihua.com



China Pulp & Paper International

 Anhui Taipingyang Special Fabrics Co., Ltd.

 Huazhang Technology Holding Co., Ltd.

 Qifeng New Material Co., Ltd.

 Shandong Century SunShine Paper Group Co., Ltd.

 Shandong Changhua Technology Co., Ltd.

 Shandong Chenzhong Machinery Co., Ltd.

 Shandong Jiefeng Machinery Manufacturing Co., Ltd.

 Shandong Renfeng Special Materials Co., Ltd.

 Shandong Sun Paper Industry Co., Ltd.

 Shandong Tranlin Paper Co., Ltd.

 Shandong Xinhe Paper-making Engineering Co., Ltd.

 Shanghai Qingliang Industry Co., Ltd.

 Shashi Light Ind. Machinery Co., LTD.

 Sichuan VANOV Technical Fabrics Co., Ltd.

 Tengzhou Lihua Mitex Rubber Roller Co., Ltd.

 Tianli Machine Building Co., Ltd.

 Weifang Hicredit Machinery Co., Ltd.

 Wenrui Machinery (Shandong) Co., Ltd.

 Shandong Sinolion Machinery Corp. Ltd.

Printing and Writing paper

unbleached printing and writing paper
(Shandong Tranlin Group)
coated woodfree paper, light-weight paper
(Sun Paper)
xerographic paper
(Sun Paper, Shandong Tranlin Group)

Tissue

unbleached tissue paper
(Tranlin Group)
white tissue paper
(Sun Paper)

Papermaking equipment

multi wire packaging paper machines
(Shanghai Qingliang, Changhua Technology)
Printing and Writing paper machines
(Changhua Technology, Shanghai Qingliang)
specialty paper machines
(Shanghai Qingliang, Changhua Technology)
Suction Former Tissue Machine(Hicredit Machinery)
crescent former tissue machines
(Shanghai Qingliang, Hicredit Machinery, Shandong Xinhe)
shoe press (Changhua Technology)
steel Yankee dryers (Shandong Xinhe, Hicredit Machinery)
headboxes (Huazhang Technology, MCN)

Pulping equipment

pressure screens
(Jiefeng Machinery, Chenzhong Machinery)
pulpers
(Chenzhong Machinery, Jiefeng Machinery)
twin roll press
(Wenrui Machinery)
disc filters
(Wenrui Machinery)
disc refiners
(Chenzhong Machinery)
cleaners
(Anqiu Tianli)

Paper converting equipment

coating machines
(Shashi Light Ind. Machinery)
film transfer sizers
(Shashi Light Ind. Machinery)
calenders
(Shashi Light Ind. Machinery)
rewinders
(Hicredit Machinery)

roll covering

rubber, polyurethane and EPMC coating
coated roll series
(Tengzhou Lihua)
thermal spraying roll series
(Tengzhou Lihua)

Contact: Wenrui Machinery +86-536-4372632 Century Sunshine Paper Group, Sunshine Oji +86-18354263562
Huazhang Technology +86-571-88994499 MCN +86-571-85096526 Qifeng New Material +86-533-7783787
VANOV Technical Fabrics +86-13438494475 Lihua Mitex Rubber Roller +86-632-5699450 Shanghai Qingliang +86-21-59741536
Shandong Tranlin Group +86-635-3961838 Taipingyang Special Fabrics +86-18955867218 Anqiu Tianli +86-536-4252808

Packaging paper

folding boxboard
(Sun Paper)
coated/uncoated white top testliner
(Century Sunshine Paper Group)
high strength corrugating medium
(Renfeng Special Materials)
coreboard
(Century Sunshine Paper Group)

Specialty paper

food wrapping paper (Renfeng Special Materials)
décor Paper (Sunshine Oji, Qifeng New Material,)
filter paper (Renfeng Special Materials)
overlay wear-resistant paper (Qifeng New Material)
base wall paper (Renfeng Special Materials, Qifeng New Material)

Dewatering devices

twill weaving/multi-axis felts
(VANOVA Technical Fabrics)
seamed felts
(VANOVA Technical Fabrics)
drying fabrics
(Taipingyang Special Fabrics)
forming fabrics
(Taipingyang Special Fabrics)

clean production

Clean production (Chenzhong Machinery)
press dehydrators
one-stop waste disposal solution, including treatment
of both liquid and solid waste (Huazhang Technology)

Automation

automatic technology
(Huazhang Technology)
Paper Roll Conveyors & Wrapping Machine
(Sinolion Machinery)

Pulp

dissolving wood pulp (Sun Paper)
unbleached straw pulp (ShandongTranlin Group)

Exporting countries and area

America, Britain, France, Japan, South Korea,
India, Vietnam, Iran, Pakistan, Brazil, Russia,
Southeast Asia, Oceania, Middle East, Turkey,
Czechia, Uzbekistan, Algeria, Peru, Malaysia,
Indonesia, Myanmar, China Taiwan



Tianli Machinery :

Integrity · Professional · Innovation



**TGC DOUBLE CONE
HIGH-CONCENTRATION SEPARTOR**

TGC Double Cone High-concentration Separator is an advanced paper pulp purification equipment, especially for wastepaper pulp, as key equipment in wastepaper recovery. This product has advantages of straightforward structure, high production capacity, easy operation, high purification efficiency, and the de-slagging mouth is free from blockage. The pulp needs only one-time separating and the additional reject treatment equipment is unnecessary. Therefore, the fiber loss is minimal.



TFY-450 HIGH-WEIGHT SEPARTOR

TFY-450 separately controls the concentration of the coarse slag through axial flushing water in order to effectively control the fiber loss effectively, which could reduce the sections and number of separators. High impurity content in the coarse slag is high, less fiber loss. Block could be avoided in the running process through the dilution of the coarse slag and continuous discharge in every section.



**TSC-600 EFFICIENT
HEAVY-WEIGHT SEPARTOR**

TSC Efficient Heavy-light separator is a type of positive going separator based on principle of centrifugal force to remove impurities from pulp. It can be used in all kinds of paper purification system to remove sand, small iron, dust, larger ink, and other heavy impurities.



**TMLC-700 BIDIRECTIONAL
SEPARTOR**

TMLC-700 multifunction separator is a modern type of multifunction paper purification equipment designed by TIANLI company on basis of domestic and foreign advanced technology. It can be applied in paper pulp purification system to remove both light and heavy impurities such as mixed refuse, olefin, adhesive substance, plastic piece, bubble, gas, sand stone, scrap iron and etc.



**TMZC-1000 HELIX
HIGH-WEIGHT SEPARTOR**

TMZC separator is a patented product specially designed by Tianli Company to solve impurity removal difficulties for paper mills based on the first generation product and the feedbacks from foreign and domestic customers. The configuration of this product is adjustable, according to user requirement, to solely separate heavy impurity or jointly separate light and heavy impurity, consequently reducing user resources investment.



**TXC-150 THIRD GENERATION
LIGHT-WEIGHT SEPARTOR**

This product mainly removes light impurity such as wax, polystyrene bubble, printing ink mark, heat dissolved conglutinate substance and etc by vortex centrifugal theory. TXC light weight separator is a new type of cost-effective equipment that resolves light impurity interference in OCC

Add: 100 meter west of Shiquan Junction, South end of Weian Road, Anqiu City, Shandong Province.

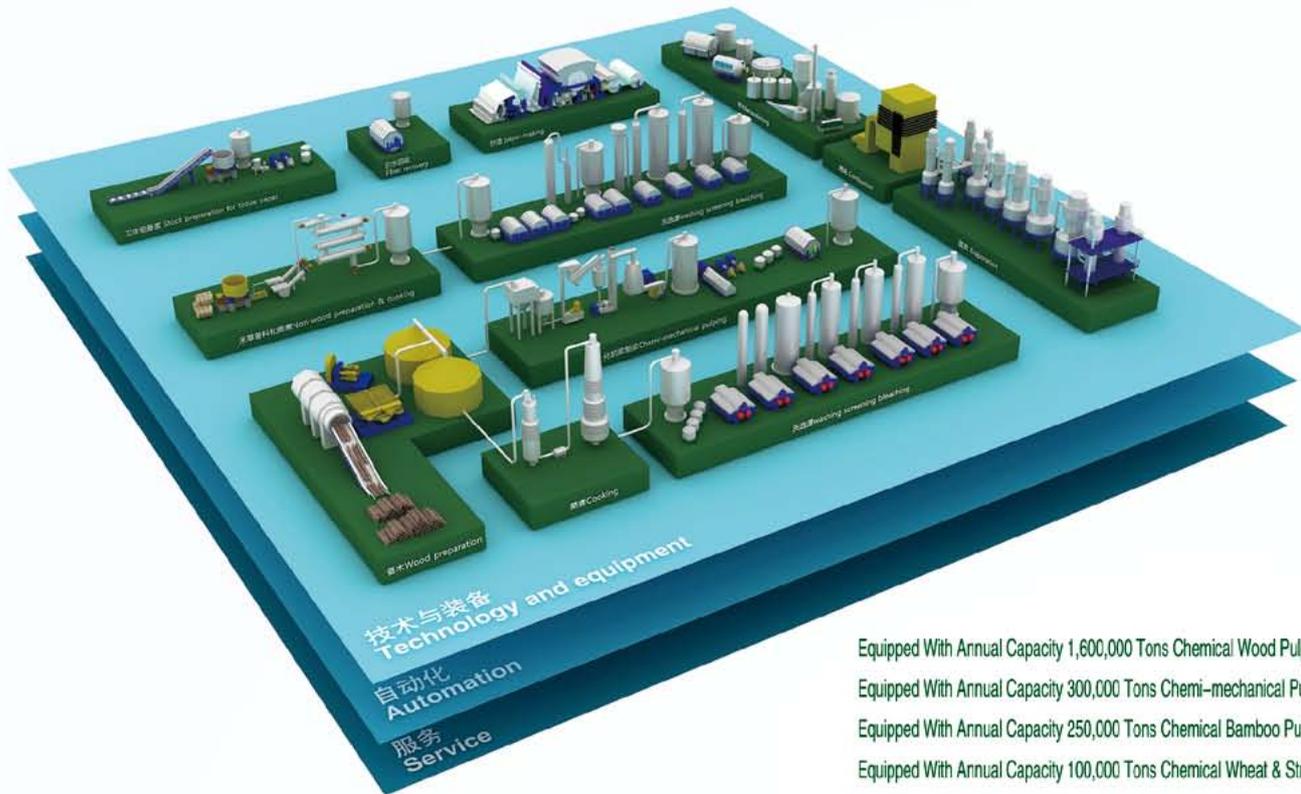
Tel: 0536-4252808/4252805 Fax: 0536-4252809 E-mail: tljx808@163.com Web: http://www.sdtljx.com



Service Provider For Pulp-paper Integration Solutions

Presently, Wenrui has serviced for more than 1000 pulp & paper mills all over the world, pulp washing equipment has a share of more than 85% in the domestic market. Our equipment was export to Canada, Brazil, India, Indonesia, Russia, Thailand, Myanmar, Vietnam, Bangladesh and Pakistan etc.

Wenrui was certified with ISO9001 quality system authentication in 1999, and was also certified with American ASME “U” stamp authentication for pressure vessel in 2012.



- Equipped With Annual Capacity 1,600,000 Tons Chemical Wood Pulping Lines
- Equipped With Annual Capacity 300,000 Tons Chemi-mechanical Pulping Lines
- Equipped With Annual Capacity 250,000 Tons Chemical Bamboo Pulping Lines
- Equipped With Annual Capacity 100,000 Tons Chemical Wheat & Straw Pulping Lines
- Equipped With Annual Capacity 300,000 Tons Recycle Paper Pulping Lines
- Equipped With Annual Capacity 60,000 Tons Tissue Paper Lines



Twin Roll Wash Press
IKPP Perawang Mill, Indonesia



Pressure Disc Filter
Brazilian JARAGUA Company



Vacuum Drum Washer
Sichuan Yibin Paper



Plate Falling Film Evaporator
Canada HSPP Pulp Mill

WENRUI MACHINERY (SHANDONG) CO., LTD.



ANHUI TAIPINGYANG SPECAIL FABRIC CO.,LTD

Our high strength flat yarn dryer fabric have super smooth surface and high drying efficiency, great anti-hydrolysis and top stability features, suitable for the dryer part of paper machine within 2000m/min speed for special paper and culture paper and packing paper and etc.

Using high strength, high anti-pollution, high anti-hydrolysis monofilament that 100% imported from Germany,

Weaved by imported heavy width Rapier loom machine, and hot air treatment in heating process
The structure is stable, running well with anti-friction, long-life performance.

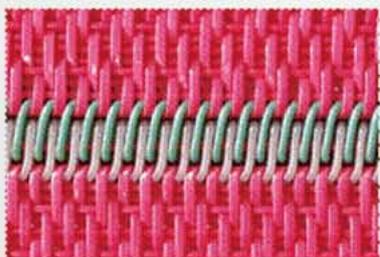
66% PPS filaments in the edges of fabric with 18-25cm

Imported PEEK spiral loop equipped with imported threading filament, imported glue for edge sealing.

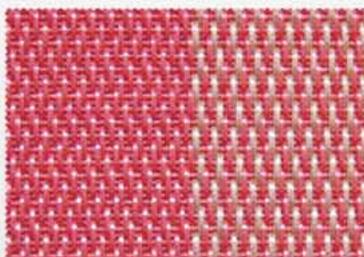
Professional press machine for wire interface to handle wire interface more fine and smooth.

Handmade zipper that greatly increase the aesthetics, practicability and efficiency of fabrics.

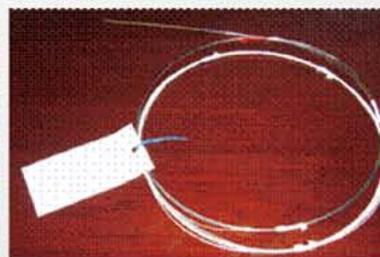
Many types for easy selection with air permeability in the range 75 to 495 CFM.



PEEK spiral loop



PPS dryer fabric edge



Imported steel wire
for connection

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