



## Award for TPM Excellence

### 1. Company Introduction

#### 1.1 BRIGHT FOOD (Group) & SSCW Profiles

BRIGHT FOOD(GROUP)CO..LTD was established on August 8, 2006. It is a comprehensive food industry group with a complete food industry chain that integrates modern agriculture, food processing, manufacturing, and food distribution.

Shanghai Sugar Cigarette & Wine Group (SSCW) is a wholly owned subsidiary of Bright Food Group and has formed a large comprehensive food enterprise group with national coverage in the fields of Sugar, Wine, Commercial Supply Chain, Asset Management, and Other Businesses.

SSCW has 11 subsidiaries, including 3 sugar production enterprises, "Guangxi Fengtang Biochemical Co., Ltd.", "Yunnan Yingmao Sugar Industry Group", and Jiangsu Dafeng Refining Sugar Factory. It has established a sugar trading system covering the national market, covering the entire sugar industry chain from raw material cultivation, production and processing, sugar refining, logistics trade, and terminal sales.



SSCW

Guangxi Fengtang Biochemical Group is a Subsidiary of SSCW.





## 1.2 Guangxi Fengtang Biochemical Co., Ltd Profile

**Fengtang Group has 10 plants. The whole group can produce sugarcane 6 million t/year, and has more than 6,000 employees, annual production 800,000 tons machine-made sugar, the annual sales revenue about 4 billion RMB, the main products are white sugar, brown sugar, pulp, edible alcohol, and compound fertilizer.**

Fengtang Group has established a circular economy industry chain, utilizing the by-products of sugar production process, such as bagasse, filter mud, and molasses, for further processing, realizing the full industry chain circular economy of bagasse papermaking, molasses production of edible alcohol, filter mud+alcohol waste liquid production of compound fertilizer, and compound fertilizer returning to the field for sugarcane cultivation.



## 1.3 Company Honors

- National Key Leading Enterprise in Agricultural Industrialization of China
- Ranked second among the top ten enterprises in China's light industry & sugar industry
- Ranked 35th among the top 100 enterprises in Guangxi Province Industrialization in China
- Leading Industrial Enterprises in Guangxi Province (First Batch) Industrialization of China



## 1.4 Fengshan Sugar Factory of Guangxi Fengtang Group

Fengshan Sugar Factory covers an area of 180000 square meters and has one sugar production line, consisting of three major workshops: power, pressing and refining, as well as one liquor production workshop. The main products are white sugar and brown sugar, and the by-products are bagasse, filter mud, and sugar molasses.

Fengshan Sugar Factory was established in 1958 and put into operation in 1964. In the initial stage, it could produce 500 tons of raw sugarcane per day, and the production capacity was maintained for 32 years. Starting from 1990, it continued to expand multiple times





due to the growth of raw sugarcane. By 2008, it had expanded to a daily processing capacity of 10,000 tons of sugarcane.

### Plant Honor (Wangshan Brand White Sugar)

#### Chinese Famous Brand



#### Famous Brand Products of Guangxi Province



### Main Information of the Factory

Cover an area	180,000 m <sup>2</sup>	Construction date	1958
Employees	556	Production date	1964
Processing sugarcane per year	1-1.4 million tons	Daily processing of raw material sugarcane	10,000 tons/day
Sugar production per year	120,000-160,000 tons	Sales revenue per year (RMB)	1 billion RMB
Product Application	Food, beverages, pharmaceuticals, etc	Market Distribution	China
Main product range	White sugar (90% by weight) Brown sugar (10 by weight)		
Technology	Squeezing and extracting juice, clarifying and purifying sugarcane juice, evaporating and concentrating, boiling sugar for crystallization, separating molasses, drying and packaging		
Major equipment	Pressers, heaters, sedimentation tanks, evaporation tanks, sugar boiling tanks, honey separators, fluidized beds, packaging machines, robotic arms, etc.		
Recognition	Passed 5 system certifications including ISO9001 Quality Management System, ISO14002 Environmental System, ISO22000 and FSSC22000 Food Safety Management System, ISO45001 Occupational Health and Safety Management System, and ISO50001 Energy Management System		



## 2. Milestones on the Journey of Manufacturing Excellence

### 2.1 Why do we need to do TPM

With the increasingly fierce global market competition, improving factory operation efficiency and product quality has become the key to sustainable development of enterprises. The current situation of the factory is that there are many deficiencies in equipment maintenance and repair standards, resulting in a high frequency of equipment short stops and downtime due to malfunctions during the production period. This will further affect the achievement of KPI indicators such as production process control, production capacity, sugar production rate, product quality, energy consumption, and increased production water consumption. In order to optimize the production process, reduce waste, improve production efficiency and quality, thereby reducing costs, enhancing customer satisfaction, and occupying a favorable position in the market. Therefore, the factory introduced World Class Manufacturing (WCM) in 2021 to transform the existing traditional management system, in order to achieve an important strategy of enhancing the factory's core competitiveness.

### 2.2 Fengshan Sugar Factory TPM Journey

Fengshan Sugar Factory, as a benchmark factory of Guangxi Fengtang Group, to further improve the operational management level of the factory, launched WCM project in February 2021. It began to introduce the TPM activity management concept to improve the daily production management of the factory. We started with the 6S, DMS, and AM pilot area teams. By continuously carrying out 6S activities, a total of 1867 6S labels have been output, achieving the goal of improving the factory environment, creating a good and safe working environment, and improving work efficiency.





By importing DMS to manage the daily production of the factory, the meeting process is standardized, streamlined and efficiency. A three-level DMS meeting system and kanban have been established at the factory level, workshop level, and shift level. By conducting daily reviews to identify issues and promptly addressing them, the department's KPI performance is continuously improved. Starting from four pilot section level DMS in 2021, by 2024, the output of improvement actions has been 132, 669, 1037, and 2150 respectively, which has increased the participation of managers and employees in achieving departmental KPIs and support for improving the KPI performance of the factory.

To improve equipment condition, reduce BD rate, and increase production efficiency. During the crushing season from December 2021 to March 2022, a pilot AM team was initiated in the honey separation area to learn and carry out labeling activities. In December 2022, the pilot AM team began to deepen its activities according to the AM step methodology. At the same time, expansion AM teams were established in each of the major workshops. When the pilot team gained successful experience, it gradually expanded to the other AM teams. By continuously carrying out labeling and eliminating HAA&SOC improvement, equipment CIL standards have gradually been established. In March 2024, a comprehensive expansion was carried out to various area of the factory, establishing 11 AM groups based on each section.

Starting from 2022, during the more than 2-year period of the AM team activities, total 1918 AM labels were output, along with results such as CIL standards and risk maps. By implementing relevant equipment maintenance standards, the factory's equipment status has been greatly improved.

#### Results of Factory AM Groups





After gaining some experience in the pilot area, we gradually expanded our work to the entire factory and implemented six main pillars: AM, PM, QM, FI, SHE and ET. Each pillar decomposes and develops its own pillar strategy based on the factory strategic objectives of "safety, efficiency improvement, quality stability, cost reduction, and refined management" formulated by the WCM Steering Committee, and carries out activities related to each pillar. Gradually, the TPM method will be integrated into the daily management of the factory's pillars.

### 3. Benefits obtained

#### 3.1 Tangible results

Since the introduction of TPM in 2022, through the implementation of pillar activities, the factory's OEE has increased from 77.44% to 93.45% in the 2023/2024 crushing season. The crushing season from December 2023 to March 2024 achieved a historic breakthrough in production line capacity, with an average daily sugarcane crushing capacity increasing from 9998.5 t/h to 10500 t/d (designed production capacity of the production line: 10,000 tons/day), reaching a new historical record. The daily average processing capacity of sugarcane increased by 527.46 t/d. By processing 1 million tons of sugarcane annually, the period of the crushing season can be shortened by 5 days, which can save 65,000 RMB in labor costs. The high-quality sugar ratio of white sugar has increased by 2.41%, and the number of customer complaints has decreased from 8 to 5 per year. Customer satisfaction has increased by 5.0%. The maintenance cost of equipment has decreased by 15.12 RMB/ton. The steam output of the production boiler decreased by 0.97% compared to sugarcane, saving more than 100 tons of boiler steam per day. The fresh-water consumption for processing sugarcane has decreased by 0.04 tons per ton of sugarcane, resulting in an annual water savings of over 40,000 tons. The goal of zero major safety incidents and occupational diseases has been achieved.

#### 3.2 Intangible results

1. Personal abilities of employees are improved through the implementation of TPM. Employees gradually learned to use advanced WCM tools to analyze and solve problems. Through in-depth learning and skill training on the principles and functions of the equipment, they will truly have a comprehensive understanding and ownership of their own machines. From 2021 to 2024, over 579 hours of TPM training activities were conducted with 3785 labels.

2. Stimulating employees' personal potential: WCM office has developed more than 10 software platforms and tools based on the actual situation of the factory, such as the "WCM Points Management Platform", "OEE Data Collection Platform", "6S/AM Label Management Platform", "CIL Writing Assistance Tool", etc., which



have been applied in practice, greatly improving the efficiency of the factory's WCM activities and management.

**3. Trained many excellent management talents:** Through participating in WCM activities, employees' abilities and skills have been improved. For example, the factory organized employees to participate in the 2024 "Bright Countryside Cup" skills competition and won the first place in the team (competition results: 3 gold medals+4 silver medals+1 bronze medal), breaking the historical record for the number of gold medals and medals won by participating companies. In the past three years, more than 20 employees have achieved career promotion through participating in WCM activities.

#### 4. The key to excellent manufacturing

##### 4.1 Vision, mission policies, and strategic deployment

Our current goal in the TPM journey is to pursue excellence awards. By continuously researching TPM methods and applying them to practical scenarios in factories, we have made significant changes in factory operation management. We believe that TPM is the best way to achieve "zero accidents, zero failures, and zero defects". We believe that TPM can effectively and systematically improve the operational management.

##### 4.2 Application of Advanced TPM Methods and Tools.

Factory has defined 8 major losses based on actual conditions. Through training and conducting activities such as loss data collection, decomposition, and methodology improvement teams in each section, the loss management concept has gradually been implanted among employees at all levels. By controlling losses, support to improve the factory's KPIs. We utilize cost deployment, OEE analysis, loss tree establishment, training, and sharing to deploy factory projects for improvement. By conducting monthly KAIZEN evaluations, employees are encouraged to participate in improvement activities to further save costs. By establishing BD collection recording platform, conducting BD loss decomposition, establishing and modifying PM standards, and improving the reliability of equipment. Other pillars have also made significant progress through TPM system methods and phased implementation steps.

##### 4.3 Employees could analyze root causes and solve problems

The challenge we face is to achieve the zero goal. The research and application of Why-Why analysis and PM analysis will help improve management. The improvement research of 'zero loss' will teach us how to achieve this goal. We firmly believe that this will help us steadily move towards becoming a world-class manufacturing factory.



## 5. Achievement record

Company & Factory Name	Guangxi Fengtang Biochemical Co., Ltd & Fengshan sugar plant
TPM logan/Objectives	Be a better version of yourself

Category	Indexes (Calculation formula)	unit	Kick off/ TPM Started	Actual Status 2024	Target 2025	
S	Number of work-related accidents requiring days off	Cases/ year	2	1	0	
S	Number of work-related accidents not requiring days off	Cases/ year	10	5	0	
P	Productivity for main products	Tons/Operator days	10.18	10.57	11	
P	OEE (or Overall Plant Efficiency)	%	77.4	93.45	94.00	
P	Availability	%	77.94	93.70	94.12	
P	Performance Rate	%	99.86	99.83	99.87	
P	Quality Products Rate	%	99.5	99.9	100	
P	Number of breakdowns	Breakdowns/ year	33	25	20	
P	MTBF	hour	105.36	163.2	245	
P	MTTR	hour	2.17	2.45	1.5	
Q	Number of customer complaints	Number/year	8	5	3	
Q	In-line defect rate (scrap)	%	1.67	1.84	1.65	
Q	In-line defect rate (rework)	%	0	0	0	
C	Cost index (RMB yuan/kg)	Cost/Unit Cost/Kilogram	4.27	5.06	4.34	
D	Production Lead time	hour	10.1	9.8	9.5	
D	Delivery performance	%	100	100	100	
S	Frequency rate	# of occupational accidents with leave for 1m worked hours	0	0	0	
M	Number of Employee Suggestions	Number/ Year	74	148	200	
Other	<Specify achievements not expressible in numerical terms> 1. Do you have a program where all employees can participate in TPM? Factory has the following platforms that allow employees to participate in TPM projects. (1) Tag activity: It is an effective platform for all employees to participate in TPM activities. Total 1100 tags had been					



found in Y2024 and the tag removal rate is about 90%. The participation rate of employees has also been increasing year by year. (2) Group activities: Another way to attract employees to work and learn best practices; (3) OPL and kaizen activities: It is a platform that encourages people to share, learn, and improve good ideas/improvements to improve equipment or process.

**2. Do you have a program allowing employees to be recognized their achievements?**

We have three ways to recognize our employees and best practices; (1) Monthly individual/team incentives: Every month, we select the top 3 outstanding employees and departments who have won reward points for bonus incentives, publish outstanding articles and make public announcements in the whole group (2) Annual Incentive: Every year, we provide cash incentives to the top 2 production workshops, top 5 production sections, and top 6 individuals who have achieved outstanding performance in the factory TPM activity. The factory will publish a commendation article and award medals to the above to recognition of their contributions to the factory TPM activity. (3) Group level incentive: the employee who won the first place in the annual TPM activity bonus points will be directly elected as the group level "exemplary individual of the company" and "excellent employee of the company".

**3. Are top management involved in the audit/verification of completion of TPM pillar steps?**

Yes, when different group/pillar steps completed, first done diagnosis by themselves, then committee will be organized to audit this area/pillar, to decide whether it pass.

**4. Are all pillar activity boards displayed and reviewed by top management?**

Yes, at the beginning of each year we develop a masterplan and detailed activity plan, which are displayed on site. The monthly committee meeting will be reviewed by senior management.

## 6.Contact

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