Profile of Tetra Pak Taipei Factory

Date: Dec. 10, 2024

Chapter 1 Company Profile

1.1 Tetra Pak Worldwide

Dr. Ruben Rausing founded Tetra Pak in 1951 to improve the distribution of liquid milk. Since then, it has become one of the world's largest suppliers of packaging systems for milk, fruit juices and many other products. Today, we develop end-to-end solutions for our customers, from product conception through processing and packaging to distribution and marketing. Our global organization consists of 100 sales offices, 27 market companies and 51 production plants, with 6 R&D centers, 7 Customer Innovation Centers and 8 Training Centers. Each day, working to meet the needs of hundreds of millions of people in more than 160 countries.

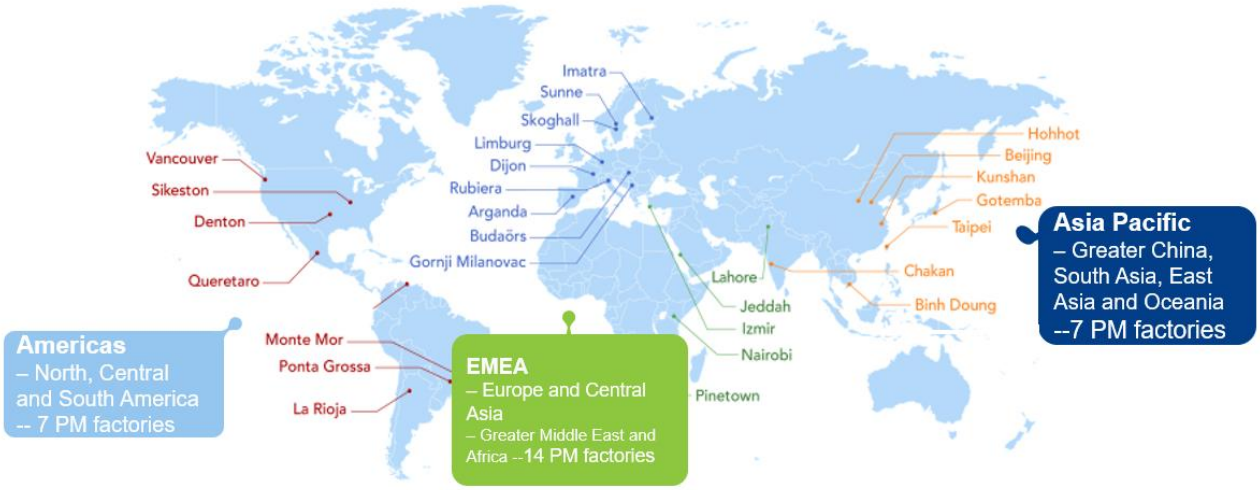


Figure 1.1 –Tetra Pak Worldwide Organization

Today, Tetra Pak has three geographic Clusters, which are Americas, EMEA and Asia Pacific as shown on Figure 1.1. Tetra Pak Taipei Factory is one of the seven factories in Asia Pacific cluster.

1.2 Tetra Pak Taipei Factory

1.2.1 Brief History

Tetra Pak Taipei factory is one of the 51 production plants around the world. It was built in 1987 in the industrial zone of Lin Kou, Taoyuan City, 25 km south of Taipei. Flexography printing for TBA (Tetra Brik Aseptic) was first introduced in the factory. In 1989, we installed the first Offset printer to meet the increasing demand on better printing quality. Our factory was ISO9002 certified in 1995, and also ISO 14001 certified two years later in 1997.

Figure 1.2 –Factory Picture

- 1987 Factory Starts – Tetra Brik Aseptic (TBA), Line Flexo
- 1989 Start Offset TBA
- 1995 ISO 9001 Certified
- 1996 Flexo Process Hansra Press Installed /Tetra Rex (TR) Start
- 1997 Tetra Prisma Start to 2006; ISO 14001 Certified
- 2002 2nd Offset Printer installed
- 2006 TR Australia transferred; British Retail Consortium (BRC) Certificated
- 2008 TBA stopped, 100% TR Offset
- 2009 Passed TPM Excellent Award
- 2011 Passed TPM Consistency Award
- 2012 Optimizes Production Flow
- 2014 FSC (Forest Stewardship Council) certified factory
- 2016 Passed TPM Special Award
- 2016 OHSAS 18001 Certified
- 2018 ISO45001 Certified, SMETA Certified
- 2019 BONSUCRO certificated
- 2021 1st TR CF with BRC GRADE AA
- 2023 TR Craft Packaging material roll out

1.2.2 The organization

The following chart is the organization chart in Tetra Pak Taipei Factory.

Figure 1.3 – Factory Organization

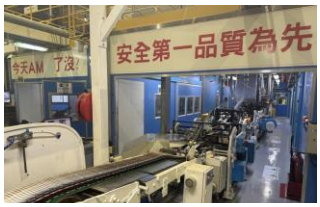
1.2.3 Machinery and Production Process

Tetra Rex (TR) Packaging material manufacturing process goes through the following 2 major steps:

- Step 1 Printing

The customer designs are printed on the board rolls. In this step, Tetra Pak Taipei Today uses Offset Press printer. The design colors are printed one by one, then Creasing and Cutting to Blank. The process is Roll to Blank. The mechanical speed can reach to 240 meters/min.

- Step 2 Side Sealing and Palletizing



The Blank put on Pallet goes to Side Seal line where the Blank will side sealing to Carton. The Carton will be accumulated and pack into the Box and palletized by Robots. Then wrapped by Stretch film then sent to warehouse waiting for delivery to our customers. The mechanical speed for Side Sealer can reach to 600 meters/min.

There are two Offset Printers and two Side Sealers in operation at the factory.

1.2.4 Staff and Work Hours

There are 90 employees of the plant as of December 2024, 57 out of which are direct positions rotating with production shifts. Number of indirect positions including management is 33. Production runs in 3 shifts of 8 hours each, working 5 days per week. Weekend production is needed in peak seasons. Management and indirect staff work during daytime hours, from 8:00 to 16:30, five days per week.

Refer to below two charts for employees' Education Levels and Service Years in the factory, with an average of 15 service years in the factory.

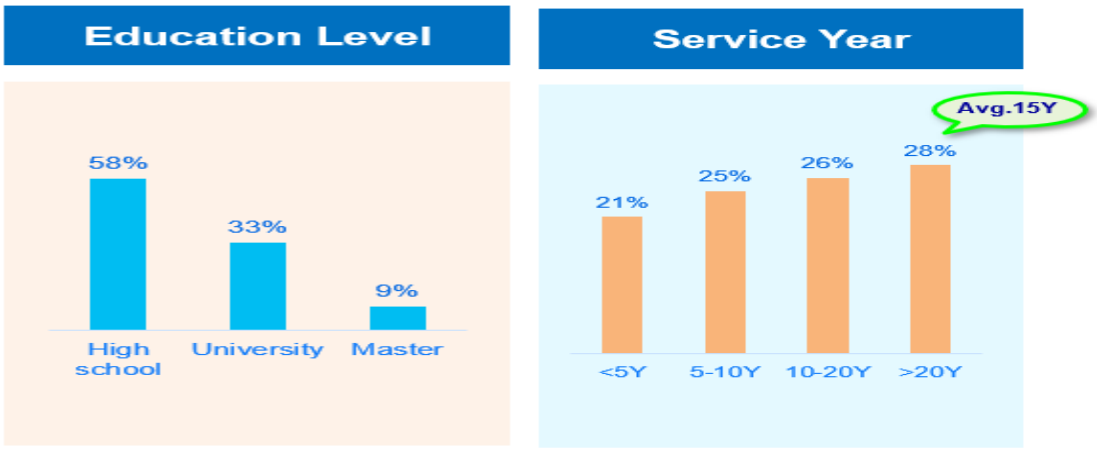


Figure 1.4 – Employees Education and Service Years

1.2.5 Main Product and Annual Production Volume

Our plant has been restructured to the 100% production of the Tetra Rex (TR) packaging material with printing Offset Press techniques since Tetra Brik Aseptic (TBA) production was stopped in March 2008.

Figure 1.5 – Seven Quality Sizes of Tetra Rex (TR)

Annual TR Production volume in the factory for 2024 was about 760 million packs with 7 quality sizes of 1000 ml (major size), 750 ml, 600 ml, 500H ml, 375 ml, 300 ml and 250 ml. About 77% productions of which were for the local market and 23% of productions were exported to the

8 overseas markets with approximately 15% of the annual volume for Australian market, the biggest overseas market for the factory, in 2024.

Chapter 2 Milestone of the Journey of Manufacturing Excellence

Individual improvement activities started in Tetra Pak Taipei factory since the day the factory was built. Machine efficiencies, breakdown maintenance, quality improvement are the main activities. However activities were not followed up in a systematic way and the results obtained were, therefore, of limited benefit.

As market conditions became increasingly complex, with increasing pressure from competitors and customers to deliver more value for less cost with higher quality. Packaging Material Manufacturing within Tetra Pak Worldwide decided in 1999 to use TPM as the competitive tool to respond to market needs and to achieve the ambitious targets by eliminating losses in the manufacturing process.

In 2001, Tetra Pak Taipei factory started to implement TPM under the name of World Class Manufacturing (WCM) project, governed by WCM Steering Committee composing of Factory Director, WCM Manager and all Functional Heads. In the first year, four pillars of AM, QM, E&T, and Cost were kicked off. We now have ten pillars built to drive the factory continuous improvement, including other seven pillars, i.e. FI, PM, EM, Safety & Health, Environment, and Office.

Our factory mission, Strategy and the related enablers are translated into the improvement plans and Key Management Indicators (KMI), Key Performance Indicators (KPI) and Key Activity Indicators (KAI) according to the Productivity-Quality-Cost-Delivery-Safety-Morale-Environment (PQCDSME). To achieve these challenging improvement targets, we have built the matrix of KPIs with pillar structure shown below to identified which pillar is the owner of the corresponding KPI. The KPI-Pillar Matrix is deployed based on Factory Mission – “Focus on quality and continuous innovation to become the customers’ preferred sustainable development factory” and Strategy as shown below.

使命 Taipei Factory Mission	Focus on quality and continuous innovation to become the customer's preferred sustainable development factory 專注品質、持續創新, 成為客戶首選的永續發展工廠						
戰略 Strategy	Ensure food safety and provide best quality 確保食安品質	Enhance Customer Experience 強化客戶體驗	Drive Cost Competitiveness Leadership 強化成本競爭力	Lead Sustainability Development 引領永續發展			
戰略目標 Strategic Objective	無可爭辯的 品質領先 Undisputed Quality Leadership	服務水準 領先 Service Level Leadership	製造總成本 領先 Full cost Leadership	綠色工廠 Green Factory	零事故 工作環境 Accident-Free Workplace	友善 工作環境 Pleasant Workplace	創新 解決方案 Innovative Solution
關鍵管理指標 Key Management Indicator (KMI)	品質案件 發生率 Issue Occurrence (MSP/Case)	完美訂單 Perfect Order (%)	製造成本 ECTC (Index)	二氧化碳排放量 CO_{2e} Emissions (kg CO_{2e}/MSP)	總可記錄 工安事故數量 No. of TRAR Accident (Case)	員工敬業度 分數 Employee Engagement Score (%)	金創意數量 Number of CML≥4 (Case)

Figure 2.1 – Factory Strategy, Mission & KMI Deployment

Strategy 戰略	Strategic Objective 戰略目標	KMI 關鍵管理指標	Cat.	關鍵管理 & 主要績效指標 KMI & Focus KPI	AM	PM	QM	FI	ET	EM	SH	Env.	Off.	Cost	Execution Department 執行部門
Ensure food safety and provide best quality 確保食安品質	Undisputed Quality Leadership 無可爭辯的品質領先	Issue Occurrence (MSP/Case) (品質案件發生率)	Q	Issue Occurrence 品質案件發生率	○	○	◎		○	○					QA, Production
			Q	No. of Approved TI 品質案件數	○	○	◎	○	○	○					QA, Production
Enhance Customer Experience 強化客戶體驗	Service Level Leadership 服務水準領先	Perfect Order (%) (完美訂單)	D	Perfect Order 完美交貨	○	○		◎							P&L, Production
			D	Production Lead Time 生產交貨期	○	○		◎							P&L, Production
			P	SSL EE - Bottleneck Machine 封合機效率	○	○		◎		○					Production
			P	Printing EE 印刷機效率	○	○		◎		○					Production
Drive Cost Competitiveness Leadership 強化成本競爭力	Full Cost Leadership 製造總成本領先	ECTC Index (Index) (製造成本)	C	ECTC Index 製造成本	○	○	○	○		○				◎	All Depts.
			C	CTC Index 生產成本	○	○	○	○		○				◎	All Depts.
			C	Total Waste 總損耗	○	○	◎	○		○				○	Production, QA
			C	Other Material Cost 其他材料費用			○							◎	P&L, Production
Lead Sustainability Development 引領永續發展	Green Factory 綠色工廠	CO_{2e} Emissions (kg CO_{2e}/MSP) (二氧化碳排放量)	E	CO_{2e} Emissions 二氧化碳排放量	○	○	○	○		○		◎	○		EHS
			E	Energy Efficiency 能源效率	○	○	○	○		○		◎	○		EHS
	Accident-Free Workplace 零事故工作環境	No. of TRAR Accident (Case) (總可記錄工安事故數量)	S	No. of TRAR Accident 總可記錄工安事故數量	○	○			○	○	◎		○		EHS
	Pleasant Workplace 友善工作環境	Employee Engagement Score (%) (員工敬業度分數)	M	Employee Engagement Score 員工敬業度分數	○	○	○	○	◎	○	○	○	○	○	All Depts.
			M	Operational Skill Gap Closure 直接人工技能水平	○	○	○		◎						Production, Maintenance
			M	Pillar Skill Gap Closure 支柱技能水平	○	○	○	○	◎	○	○	○	○	○	(Pillars)
			M	AM Team Reaching Step 6 達到第6步驟的AM小組	◎	○	○		○		○				Production
	Innovative Solution 創新解決方案	Number of CML≥4 (Case) (金創意數量)	M	No. of CML>=4 Solution 金創意解決方案數量	○	○	○	○	○	○	○	○	○	○	© StC

◎ Driver ○ Key Support

Figure 2.2 – Strategy Deployment to Focus KPIs and Driver Pillar/ Department

Chapter 3 Benefits Achieved

Since implementing TPM, our performance has significantly improved. Additionally, it has taught us how to systematically handle facts and data from the perspective of loss elimination.

Here is the summary of our results compared to 2016, the year we successfully passed the Special Award.

- Customer claims has decreased by 55.17%.
- Equipment Effectiveness (Side Sealing Process) has improved by 15.85%
- Number of breakdowns has decreased by 47.27%
- Production lead time has been reduced by 28.76%.
- Increase commitment and engagement from all levels of employee thru 100% TPM/WCM involvement.

Since the application of TPM principles, we have extensively developed the skills and capabilities of our employees. Since implementation, hundreds of teams have been initiated and delivered perfect results, with every operator involved. These teams have increased our operators' knowledge of our business and WCM.

Chapter 4 Key of our Manufacturing Excellence

The key to our Manufacturing Excellence lies in the following six major areas and we are planning to keep enhancing all areas and drive our factory towards our Factory Mission – “Focus on quality and continuous innovation to become the customers’ preferred sustainable development factory” via continuing strong TPM/WCM implementation.

- Continuous Improvement via TPM/WCM Activities
- Involvement & Engagement of All Levels of Employee
- Zero Loss Mindset and System
- Standardization to Maintain the Gained Performance
- Competency Development of Human Resource & Keep People Motivated
- Benchmarking & Best Practice Sharing

Chapter 5 Achievement Record

TPM Award Assessment Achievement Sheet

Company & plant name	**Tetra Pak Taiwan Ltd.**
TPM Slogan/ Objectives	Focus on quality and continuous innovation to become the customers' preferred sustainable development factory

Category	Index (Calculation Formula)	Unit	TPM Special 2016	Actual Status 2024	Target 2025	JIPM Use
S	Number of work-related accidents requiring days off work	Cases/ year	0	0	0	
P	Productivity	Std packs per person	549	557	546	
P	Equipment Effectiveness (Printing Process)	%	55%	58.7%	60%	
P	Equipment Effectiveness (Side Sealing Process)	%	56.8%	65.8%	67%	
P	Number of breakdowns	case	55	29	24	
P	MTBF(Breakdown) -Printing	Hour	192	659	622	
P	MTBF(Breakdown) -Side Sealing	Hour	3,077	621	835	
Q	Number of customer complaints	Number/year	29	13	8	
Q	In-line defect rate (scrap)	%	8.58%	7.84%	7.54	
C	Cost index	Index	100	108	114	
E	Co2 Emission (kg/MSP)	kg CO2e/ MSP	8,360	7,550	7,475	
D	Production Lead time	Days	2.26	1.61	1.53	
D	Delivery performance	%	NA	91.6%	92.5%	
M	Employee Engagement Score	%	NA	88	89	
M	Number of Employee Suggestions	Number/year	NA	21	20	
Other	<Specify achievements not expressible in numerical terms> 1. Do you have a program where all employees can participate in TPM? 2. Do you have a program allowing employees to be recognized their achievements? 3. Are top management involved in the audit/verification of completion of TPM pillar steps? 4. Are all pillar activity boards displayed and reviewed by top management?					

Note: Have the indexes cover all important items related to PQCDSM measures being undertaken in the entirety of the subject to be assessed.
Note all indexes in the TPM General Condition Report. TPM Activity Report. Where your specific indices vary from those above attach relevant data.