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PHILIPPINES

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彰化工廠 **MODULE PLANT**

彰化縣彰化市中山路三段359號

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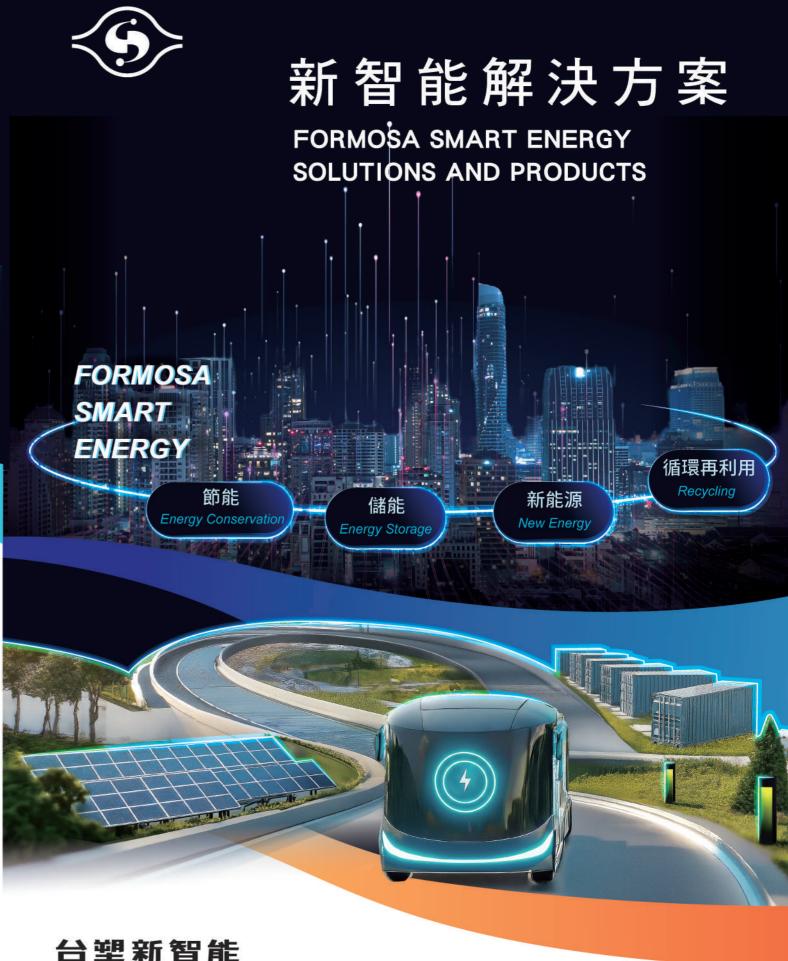
台塑尖端能源 彰化彰濱電芯廠 **BATTERY CELL & MODULE PLANT**

彰化縣鹿港鎮山崙里21鄰崙安路28號

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FORMOSA SMART ENERGY



從太陽能、風能,到潮汐能、地熱能, 再到生物能、氫能等,

新能源以其可再生和環保的特性,

被認為是我們走向永續發展的重要途徑。

這些新能源不僅可以幫助我們降低對傳統能源的依賴, 從而緩解環境暖化問題,

同時也有可能開創出一種新的經濟發展模式, 為未來的社會發展提供持久的動力。

Due to its climate-friendly nature, new energy generated from renewable natural resources such as wind and sunlight is considered the path towards a more sustainable future.

Renewable energy not only helps reduce our reliance on traditional energy generated from non-renewable resources such as coal, oil and natural gas, which leaves a significant negative impact on the environment, it also creates the opportunity for a new energy-economic development model to emerge.

3,000座 以上的建置實績

全球超過 25個建置地

15 年 以上的經驗累積 Over 15 Years of

產品索引 PRODUCT OVERVIEW

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可靠技術 Trustworthy ▶組織系統 **Systematic** 簡單安全 Safe

智慧平衡 Intelligent

FORMOSA SMART ENERGY 2025~

2024

2022

2020

2014

2010 2008

台塑生醫成立「台塑鋰鐵材料科技」 專注於氧化鋰鐵磷正極材料的研發、 生產與銷售。

Formosa Biomedical Technology Corp. (FBC) established "Formosa Lithium Iron Material Technology" to focus on the research, development, production and sales of lithium iron phosphate (LFP) cathode material.

成立台塑生醫電池專案組,積極 投入各式鋰鐵電池產品的開發與 國內銷售。

Established the "Formosa Biomedical Battery Team", actively develop and sell a variety of lithium iron phosphate battery products in the domestic

開始外銷到美國、中國、越南、 菲律賓等地。國內外廠商陸續 採用鉀鐵電池來汰換舊有的 鉛酸電池。

Started exporting internationally to countries such as the United States, China, Vietnam, and the Philippines. Both local and foreign companies started adopting LFP batteries to replace their lead-acid batteries.

推動鋰鐵電池模組100%自產。 並取得UL、IEC、S-JET、UL JAPAN及UN38.3等指標性認證。

2018

Started pushing for the production of LFP batteries and modules to be 100% in-house and obtained certifications given out by third-party safety laboratories in compliance with UL, UL Japan, IEC, S-JET, and UN38.3 standards.

發展兆瓦級儲能系統(MW)並參與 工研院主導之區域儲能示範驗證 計劃,於彰濱設置1.5MW/1.5MWh 儲能系統。

Started getting into energy storage and installed a 1.5MW/1.5MWh ESS container in the Changhua Coastal Industrial Park for the "Forward-Looking Infrastructure Demonstration Program" led by ITRI.

由台塑、南亞、台塑石化、台化、台塑 生醫合資成立台塑新智能科技公司。於 台塑生醫彰化觀光工廠建置台灣首座 1.2MW/1.3MWh的sReg儲能案場。

Formosa Smart Energy Tech Corp. (FSE) was established as a joint venture by Formosa Plastics, Nan Ya Plastics, Formosa Petrochemical, Formosa Chemicals & Fibre, and Formosa Biomedical. FSE has since built Taiwan's first 1.2MW/1.3MWh sReg energy storage project at the FBC Changhua Plant.

台塑新智能科技公司在彰濱 工業區分別設置電池模組廠及 鋰鐵電芯廠(台塑尖端能源), 於2024年下半年完工量產 (2.1GWh) °

FSE set up both a LFP battery module plant and a LFP battery cell plant (Formosa AdvEnergy) in Changhua Coastal Industrial Park with a total capacity of 2.1GWh.

The construction of phase 1 of both factories completed towards the end of the year and production has 台塑尖端能源之電芯及模組陸續 出貨儲能及電動車市場,並投入 第二期擴建。

Formosa AdvEnergy's battery cells and modules are now steadily supplying the energy storage and EV markets, with Phase II expansion already underway.





Taiwan's largest LFP Battery Plant

全台最大鋰鐵電芯基地 彰濱尖端電芯廠

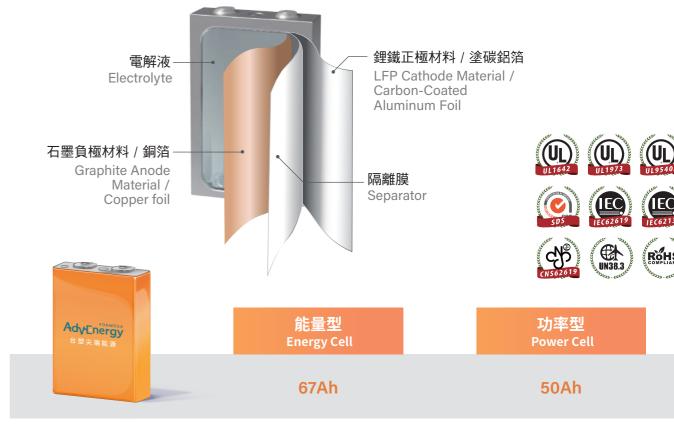
可平抑電網波動的區域型電力緩衝及儲存系統逐漸成為主流趨勢,

除此之外,亦可增加傳統電廠發電效率與再生能源滲透率,

台塑新智能儲能系統是建立於主、從架構與模組化設計下逐步延伸擴充,

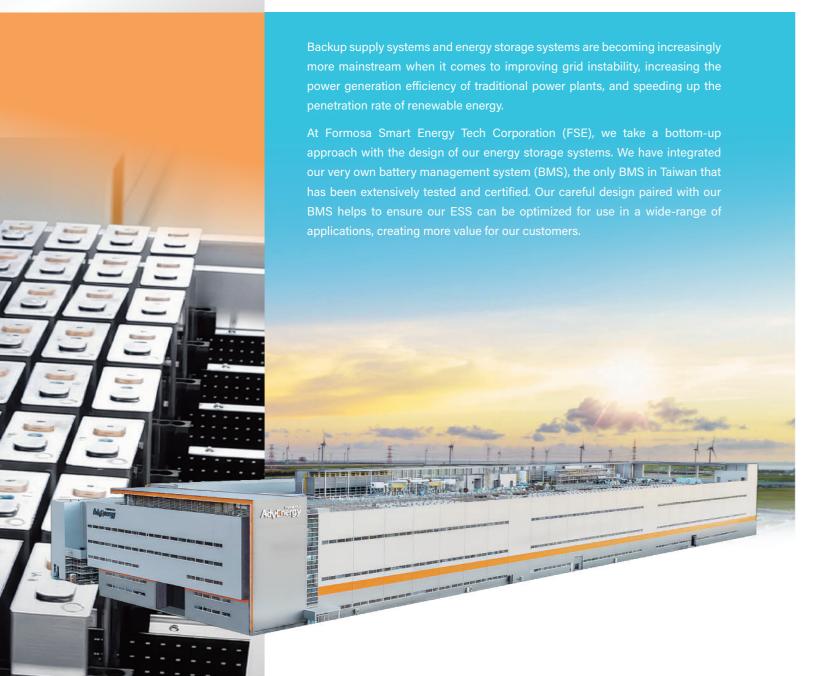
並使用台灣唯一經過廣泛驗證的電池管理系統,

可使儲能系統在各種應用中達到最佳化,使客戶獲得更多,付出更少。



用途 APPLICATION	適用於儲能櫃、 家用儲能、電動車 C&I, Residential ESS, EV	適用於UPS、電動機具及 高功率動力輸出 UPS, Electric Vehicle, High-power Supply
能量密度 ENERGY DENSITY	175 Wh/kg	128 Wh/kg
體 積能量密度 VOLUMETRIC ENERGY DENSITY	353 Wh/L	279 Wh/L
25℃循環壽命 25℃ CYCLE LIFE	≥4000次	≥3000次
45℃循環壽命 45℃ CYCLE LIFE	≥2000次	≥1500次
尺寸(含外包膜) DIMENSION (INCLUDING OUTER FILM)	D42.9 * W100 * H141 mm	D42.9 * W100 * H141 mm
重量 WEIGHT	1235±37g	1250±37g

[•] 詳細規格請參閱規格書 Please refer to the product datasheet for more details.

















電池模組







項 目 Item	24V UPS 不斷電系統應用		48V UPS 不斷電系統應用	12V DC Charger 直流機系統應用
規格 Specification	24V50Ah	24V67Ah	96V50Ah	12V134Ah
型號 Model	LFP-24V050AH-B	LFP-24V067AH-B	LFP-96V050AH-B	LFP-12V134AH-B
電壓 DC Voltage	25.6 V	25.6 V	96 V	12.8 V
容量 Capacity	1.28 kWh	1.72 kWh	4.8 kWh	1.72 kWh
最大充電電流 MAX Charging Current	100 A (2C)	67 A (1C)	100 A (2C)	110 A (0.8C)
最大放電電流 MAX Discharging Current	325 A (6.5C)	110 A (1.6C)	400 A (8C)	130 A (0.97C)
配置 Configuration	8S1P	8S1P	30S1P	4S2P
尺寸 Dimension D*W*H	575*130*208 mm	575*130*208mm	846*280*200mm	351*221*184mm
重量 Weight	17 kg	17 kg	64 kg	13.6 kg

[•] 詳細規格請參閱規格書 Please refer to the product datasheet for more details.





48V ESS 儲能系統 48V67Ah 48V134Ah 規格 Specification 型號 Model LFP-48V067AH-A LFP-48V134AH-A 電壓 51.2 V 51.2 V DC Voltage 容量 3.43 kWh 6.86 kWh Capacity 最大充電電流 53.6 A (0.8C) 110 A (0.8C) MAX Charging Current 最大放電電流 110 A (0.8C) 110 A (1.6C) MAX Discharging Current 16S1P 16S2P Configuration 尺寸 950*235*181mm 612*221*184mm Dimension D*W*H 重量 30 kg 57 kg Weight

• 詳細規格請參閱規格書 Please refer to the product datasheet for more details.





Rack 機櫃 480V50Ah

UPS 電池系統 半導體廠備援專用

UPS System for Semiconductor Factory Backup



UPS 應用電池系統 · · · · · · · · · · · · · · · · · · ·				
項 目 Item	廠辦備援專用 Factory Backup		數據中心備援專用 Data Center	直流機應用系統 DC Charger
規格 Specification	480V50Ah	480V67Ah	576V100Ah	108V134Ah
型號 Model	US050-160IMS5	US067-160AMS1	HC480HU	DC134-036BPS1
電壓 DC Voltage	512 V	512 V	576 V	115.2 V
容量 Capacity	25.6 kWh	34.3 kWh	57.6 kWh	15.4 kWh
最大充電電流 MAX Charging Current	100 A (2C)	67 A (1C)	200 A (2C)	110 A (0.8C)
最大放電電流 MAX Discharging Current	325 A (6.5C)	110 A (1.6C)	405 A (8C)	130 A (0.97C)
配置 Configuration	20S1P	20S1P	6S2P	9S1P
尺寸 Dimension D*W*H	800*600*2100mm	800*600*2100mm	946*667*2150mm	800*650*1600mm
重量 Weight	563 kg	563 kg	1200 kg	278kg

• 詳細規格請參閱規格書 Please refer to the product datasheet for more details.









Weight







	戶外型儲能系統 Outdoor E	ESS
規格 Specification	768V134Ah	1056V134Ah
型號 Model	ES134-256CMF2α	ES134 -352GMF1
電壓 DC Voltage	819.2 V	1126.4 V
容量 Capacity	109.77 kWh	150.93 kWh
最大充電電流 MAX Charging Current	100 A (0.7C)	100 A (0.7C)
最大放電電流 MAX Discharging Current	110 A (0.8C)	110 A (0.8C)
配置 Configuration	16S1P	22S1P
配備 Equipment	空調系統、消防系統 煙偵感測器、偵溫感測器 Air Conditioning System, Fire Fighting Equipment, Smoke Detector, Temperature Sensor	
尺寸 Dimension D*W*H	1000*1250*2550mm	1000*1250*2550mm
重量 Weight	1325 kg	1700 kg

• 詳細規格請參閱規格書 Please refer to the product datasheet for more details.

7



電芯一致性 CELL CONSISTENCY

全系統動態智慧平衡 Battery Cell Balancing System

可以修正電芯製作過程中的細微電氣差異,並補償充電直流 阻抗的時間衰變,除了延長電池系統安全使用壽命,並可合理 擴大電池可操作範圍,提升電池系統穩定性。

With our battery cell balancing system, subtle electrical differences introduced during the cell manufacturing process can be corrected, and the time decay exacerbated by DC internal resistance can be offset. Not only does our balancing system extend the safe operating lifespan of the battery system, it also helps expand the operational range and enhances the stability of the battery system.



分層架搆管理

智慧平衡系統 Smart Balancing System



Hierarchical BMS



Redundant Subsystems

Double Protection

BMS功能 BMS FEATURES

保護板架構符合IEC/UL60730-1認證

Our battery management system passes the IEC/UL60730-1 certification standard

擁有智慧平衡演算、二階隔離控制系統、子系統可相互 備援,自動復歸、多重隔離高安全電源與遠端控制系統、 可進行高精準非接觸的安時量測計算。

Programmed with smart balancing algorithms and equipped with a two-stage isolation control system, redundant subsystems, a self-reset system, and a remote control system, our BMS allows for high-precision and contact-less ampere-hour measurement calculations.







Rack 機櫃 1056V134Ah 高壓版 High Voltage 儲能電池系統











ESS 儲能電池系統				
規格 Specification	768V67Ah	768V134Ah	1056V134Ah	
型號 Model	BR108-256AMF	ES134-256CMF2	ES134-352GMF1	
電壓 DC Voltage	819.2 V	819.2 V	1126.4 V	
容量 Capacity	54.88 kWh	109.77 kWh	150.93 kWh	
最大充電電流 MAX Charging Current	67 A (1C)	100 A (0.7C)	100 A (0.7C)	
最大放電電流 MAX Discharging Current	110 A (1.6C)	110 A (0.8C)	110 A (0.8C)	
配置 Configuration	16S1P	16S1P	22S1P	
尺寸 Dimension D*W*H	667*545*2001mm	985*560*2001mm	985*560*2439mm	
重量 Weight	654kg	1150kg	1480kg	

• 詳細規格請參閱規格書 Please refer to the product datasheet for more details.

10



20呎貨櫃 20'CONTAINER TEU

















使用磷酸鋰鐵電池 Utilizes LFP batteries



防水等級:IP54 Ingress Protection rating: IP54



抗腐蝕防鏽等級:ISO 12944 C5 Corrosion Class: ISO 12944 C5

符合ISO 1496、TIR認證、國際集裝箱安全公約及 集裝箱標準、IEEE 693 HIGH LEVEL標準

Complies with ISO 1496, TIR certification, International Convention for Safe Containers(CSC) and container standards, IEEE 693 HIGH LEVEL standards.



ESS 貨櫃型 儲能系統				
型號 Model	FESS 20-134A	FESS 20-134B	FESS 20-134C	
電壓 DC Voltage	819.2 V	1126.4 V	1126.4 V	
容量 Capacity	1.97 MWh	2.71 MWh	3.01 MWh	
最大充電電流 MAX Charging Current	100 A (0.7C)/Rack	100 A (0.7C)/Rack	100 A (0.7C)/Rack	
最大放電電流 MAX Discharging Current	110 A (0.8C)/Rack	110 A (0.8C)/Rack	110 A (0.8C)/Rack	
配置 Configuration	16S18P	22S18P	22S20P	
尺寸 Dimension D*W*H	6058*2438*2896mm	6058*2438*2896mm	6058*2438*2896mm	
重量 Weight	26.8 ton	33 ton	36 ton	
	直流盤 DC Busbar	偵溫感測器 Temperature Sensors	漏電偵測器 Residual Current Device	
	監控盤 HMI	氣體品質偵測器 Gas Detectors	雷擊突破吸收器 Surge Arrester	
配備 Equipment	空調系統 Air Cooling System	不斷電系統 UPS System	積水感測器 Liquid Alarm Sensors	
	消防系統 Fire Protection System	高壓保險器 High-Voltage Fuse	大電流直流隔開關 High Current DC Disconnector	
	煙偵感測器 Smoke Detectors			

• 詳細規格請參閱規格書 Please refer to the product datasheet for more details.

*因應案場實際應用配置 Based On The Actual Application Requirements Of The Project.





標準儲能 電池模組 **STANDARD** MODULE

電池保固 十年 10-YEAR WARRANTY

高達3,600次 循環壽命 OVER 3,600 CYCLE LIFE

智慧平衡 SMART **BALANCING**

自動斷電 保護 POWER-OFF PROTECTION

防火材質 **FIREPROOF MATERIALS**





• 詳細規格請參閱規格書 Please refer to the product datasheet for more details.



可透過清潔能源充放電,無須燃料, 安全穩定,邁向淨零永續環境。



功率 [k w] POWER	6
標稱輸出電流 [A] NOMINAL DISCHARGE CURRENT	毎相 25A
標稱輸出電壓 [Vac] NOMINAL DISCHARGE VOLTAGE	120/208/240
標稱直流電壓 [Vdc] NOMINAL DISCHARGE VOLTAGE	48
最大充電電流[A] MAXIMUM CHARGING CURRENT	120
防水防塵等級 IP RATING	IP65
操作溫度範圍 OPERATING TEMPERATURE RANGE	-10~55°C
尺寸[HxWxD, mm] DIMENSION	700*515*215.5
重量[kg]	41

WEIGHT



可積木式堆疊選用容量 Can be stacked to increase energy storage capacity

可搭配太陽能系統使用 Can be paired with a photovoltaic (PV) system

配合時間電價優化電費

Can be used strategically to decrease electricity costs





高安全性 高能量密度 動力電池系統

High Safety & High Energy Density Battery System



CNS16160 經濟部標準檢驗局

電動車輛用電池及電池系 統實施自願性產品驗證

The BSMI of the Ministry of Econor Affairs implements voluntary produverification for batteries and batte systems used in electric vehicles



IFC62133

IEC62620

UL1973 **UL2580** 電動汽車電池 (模組)

電動道路車輛用鋰離子 電芯和電池的安全要求 的安全性標準

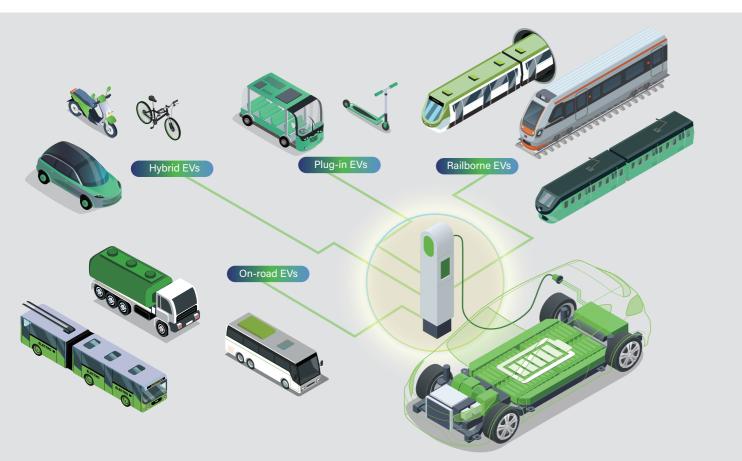


UN38.3 聯合國危險貨物運輸 《貨物運輸條件》



ECE R100.03 歐盟車用動力電池 安全性標準

EU safety standards for automotive power batteries.





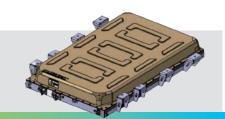


尺寸

重量

WEIGHT





230 kg

成組方式 CONFIGURATION	2P12S/2P14S		
標準電量 NOMINAL ENERGY	44.5kWh		
能量密度 WEIGHT ENERGY DENSITY	>123Wh/kg		
標準電壓 NOMINAL VOLTAGE	332.8V		
工作溫度 OPERATIONAL TEMPERATURE	Charging: 0~55°C Discharging: -30~60°C		
熱管理 THERMAL MANAGEMENT	Liquid cooling		
IP防護等級 IP LEVEL	IP67		
尺寸 DIMENSION	1525*906*211mm		
重量	360kg		

混凝劑

Coagulant

NJ01

微藻廢水處理

WASTEWATER TREATMENT



- 移除鉬(Remove Molybdenum)
- 2. 適用於化學原材料製造業
- 用量約0.1~0.15% (w/w)
- 4. 反應時間10分鐘
- 移除率80~90%以上



ZMF-03

1. pH 7~9

5. 移除率99%

移除鋅(Remove Zinc)

- M M M H H

酵益好 り

培養基

- 2. 適用於金屬相關製造業、光電業 Applicable Industry: Metal-related Manufacturing, Optoelectronics Industry
- 3. 用量約0.1% (w/w) 3. 用量約1~2% (w/w)
- **4.** 反應時間10分鐘 Reaction Time: 10 mins 4. 反應時間10分鐘



適用於金屬相關製造業

移除率70~80%

Applicable Industry : Metal-rela Manufacturing

1. pH 9~10

泛用型製劑(Multipurpose Agent) 移除硼(Remove Boron)

- 2. 適用於食品、生活用品業
- 3. 取代傳統PAC,反應後汙泥量 減少20%

Replace traditional PAC, resulting in 20% less sludge

*用量依廢水特性調整 Dosage adjustable based on wastewater charact



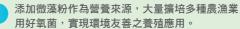
AGRICULTURAL APPLICATION

酵益好培養基 InnoGreat BioM1

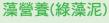




1,000g/bg



- Formulate with microalgae powder as a nutrient source
 Support large-scale cultivation of various aerobic bacteria
 Beneficial for agricultural and aquacultural applications
- · Promote environmental friendly and sustainable practices



InnoGreat algae



1,000g/btl

改善養殖水質與底泥環境,同時是輪蟲、米蚤等 愛用的營養餌料,為友善養殖首選。

Improve water quality and sediment conditions in aquaculture.
 Serve as a preferred nutritional feed for rotifers and other zooplankton.





工業業務 農業業務

Model	50L平行管道設備 50L Photobioreactor	150L平行管道設備 150L Photobioreactor	600L平行管道設備 600L Photobioreactor	5000L平行管道設備 5000L Photobioreactor
管柱數 NUMBER OF TUBES	10	24	64	352
管道總容量[L] VOLUME OF TUBES	30	70	400	4,000
緩衝槽^[L] TANK	20	100	200	1,000
<mark>佔地面積[L*W*H, cm]</mark> LAND AREA	200*100*120	220*100*170	850*150*200	2,500*150*250
操作溫度[°C] OPERATING TEMP.	15~40	15~40	15~40	15~40
光源 LIGHT	RGB	RGB	RGB	RGB

管道式設計

1990

可控制環境

CH ALGAE
CO., LTD. 湿漉料接級分析限公司

半自動清洗

固碳效率高

占用空間少

TUBULAR PHOTOBIOREACTORS

工業型管道光生物反應器

