

# STEAM BOILER

ONCE-THROUGH TYPE - HEAVY OIL

## 貫流式蒸汽鍋爐 - 重油



前瞻

Advanced

創新

Innovation

人性化

Users Friendly

## 產品特點

## PRODUCT FEATURE

### 燃燒效率

### Combustion Efficiency

#### 1. 爐體構造吸熱效果佳，鍋爐燃燒效率最高達96%。

Boiler structure with excellent heat-absorption provides combustion efficiency up to 96%.

#### 2. 選配合適的給水預熱器，提升鍋爐運轉效率同時節省燃料。

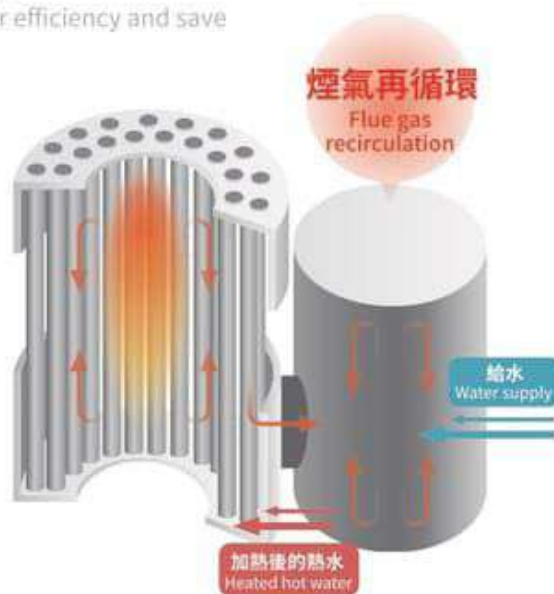
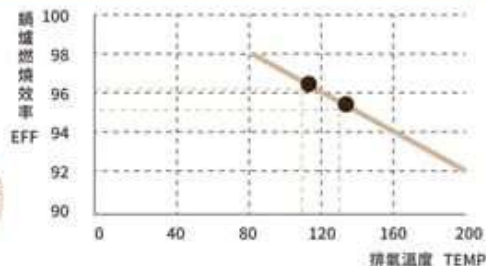
Equipped with the proper feed water preheater can increase the boiler efficiency and save fuel consumption at the same time.

節能  
Energy saving

排氣溫度下降，穩定維持鍋爐燃燒效率。  
The exhaust temperature drops to maintain the boiler combustion efficiency.

排氣溫度 ↓  
Exhaust temperature  
鍋爐燃燒效率 ↑  
Combustion efficiency

達節能效果  
Energy saving



減碳  
Carbon reduction

高燃燒效率減少燃料使用量，降低CO<sup>2</sup>排放量。  
Reduce CO<sup>2</sup> emissions and achieve environmental sustainability goals.

省燃料  
Fuel saving

鍋爐給水經給水預熱器吸收熱量，提高給水溫度，降低燃油消耗量。  
The boiler feed water absorbs heat through the feed water preheater, which increases the feed water temperature and reduces fuel consumption.

以型號ZH1000HF為例，燃燒效率96%與93%分別在一天工作八小時的情況下(B重油費率設定為\$20，實際費率依當地情況而定)：  
Take the model ZH1000HF as an example, when the combustion efficiency is 96% and 93% when working eight hours a day (B heavy fuel rate is set to \$20, the actual rate depends on local conditions):

節省燃料量(年) :  $[65 - (539000 \div 8910 \div 96\%)] \text{L/h} \times 8 \text{hr/day} \times 365 \text{day/year} = 5840 \text{L/year}$

Fuel saving (year)

節省燃料費(年) :  $5840 \text{L/year} \times \$20/\text{L} = \$116,800/\text{year}$

Fuel cost saving (year)

燃燒效率相差3%的情況下，一年節省\$116,800的燃料費。  
With a 3% difference in combustion efficiency, you can save \$116,800 in fuel costs a year.





- 噴砂處理  
SAND BLASTING
- 熱浸鍍鋅處理  
HOT DIP GALVANIZED PROCESS



**O型給水預熱器**  
O TYPE FEED WATER PREHEATER

適用於ZH-1500H-ZH-2000H鍋爐  
Suitable for ZH-1500H-ZH-2000H boiler

**E型給水預熱器**  
E TYPE FEED WATER PREHEATER

O型及E型給水預熱器爐管使用無縫鋼管經噴砂、熱浸鍍鋅處理降低低溫腐蝕發生，延長使用壽命。  
O type and E type feed water preheater use seamless steel tube processed with sand blasting and hot dip galvanized. These processes can prevent low-temperature corrosion and extend the use-life.



- 不銹鋼管  
STAINLESS STEEL TUBE

O型給水預熱器，獨特不銹鋼熱交換管的設計，燃燒效率可更高且節能效果更佳。

O type feed water preheater uses the unique design stainless steel heat exchange tubes which increase both combustion and energy efficiency.

**O型給水預熱器**  
O TYPE FEED WATER PREHEATER

適用於ZH-300H-ZH-1000H鍋爐  
Suitable for ZH-300H-ZH-1000H boiler



- 不銹鋼管  
STAINLESS STEEL TUBE

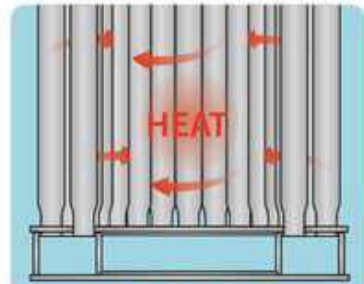
G型給水預熱器，獨特不銹鋼熱交換管的設計，燃燒效率可更高且節能效果更佳。

G type feed water preheater uses the unique design stainless steel heat exchange tubes which increase both combustion and energy efficiency.

**G型給水預熱器**  
G TYPE FEED WATER PREHEATER

燃燒時氣體高速流動鍋爐內的水管群間，大幅提升熱吸收的效率，達到良好的傳熱效果。

During combustion, the gas flows between the water pipe groups in the boiler at a high speed, which greatly improves the efficiency of heat absorption and achieves a good heat transfer effect.



傳熱示意圖  
Heat transfer schematic diagram

耐用性高  
High durability

促進熱對流  
Promote heat convection

水管均勻受熱  
Water pipes are heated evenly

1. 點火4~5分鐘獲得足壓蒸汽。

With sufficient steam obtained 4-5 minutes after ignition.



2. 蒸汽乾度最高達**99.95%**，節省不必要的燃料浪費，達到節能減碳的效果。

Steam dryness up to 99.95%. Automatic discharge device used to detect boiler water concentrated electrical conductivity. Stable control of boiler water and steam quality, extending boiler service life.

節能高效運轉  
Energy-saving and efficient operation

高乾燥蒸汽所含的熱量較多，以減少蒸汽使用量，達到節能運轉的效果。  
Highly dry steam contains more heat to reduce the amount of steam used and achieve the effect of energy-saving operation.

在蒸汽乾度99.95%及98%的7公斤飽和蒸汽中，其實際熱含量分別為何？

What is the actual heat content of 7 kg saturated steam with a steam dryness of 99.95% and 98%, respectively?



在年間總蒸汽量7200000kg/年的情況下，兩者燃料使用量相差多少？

In the case of a total annual steam volume of 7,200,000 kg/year, what is the difference in fuel consumption between the two?

$$7200000 \text{ kg/year} \div 8910 \text{ kcal/L} \times 9.543 \text{ kcal} = 7712 \text{ L}$$

蒸汽乾度相差1.95%的影響下，可以節省7712L的重油量。  
Under the influence of 1.95% difference in steam dryness, 7712 liters of heavy oil can be saved.

減少損壞因子  
Reduce damage factor

降低設備使用負擔，延長使用壽命。  
Reduce the burden of equipment use and extend the service life.



3. 自動排放裝置隨時偵測爐水濃縮電導度，穩定控制爐水及蒸汽品質，延長鍋爐使用壽命。

Automatic discharge device used to detect boiler water concentrated electrical conductivity. Stable control of boiler water and steam quality, extending boiler service life.



### 1. 診斷鍋爐運轉狀況及協助故障排除。

Identify Boiler's Operating Conditions and Assist with Troubleshooting.

### 2. 紀錄故障時間、位置、蒸發量、燃料消耗量、給水量、蒸汽壓力、水管溫度、排氣溫度、給水溫度。

Record: Malfunction Time, Malfunction Position, Evaporation Amount, Fuel Consumption, Feed Water Amount, Steam Pressure, Water Tube Temperature, Exhaust Temperature and Feed Water Temperature.

### 3. 紀錄統整&列印日報表及月報表。

Integrate Records & Print Daily Reports and Monthly Reports.



同時監控多台鍋爐運轉

Monitor and Control Several Boilers Concurrently.



## 空間及流程圖

## SPACE & PROCESS CHART



中央廚房 Central Kitchen

01. 燃油槽	Fuel Tank	13. 鍋爐本體	Boiler Body
02. 循環油泵浦	Circulation Oil Pump	14. 安全閥	Safety Valve
03. 配管加熱器	Pipe Heater	15. 蒸氣出口閥	Steam Valve
04. 回油閥	Feedback Oil Valve	16. 汽水分離器	Steam Separator
05. 過濾器	Strainer	17. 煙囪	Chimney
06. 燃油泵浦	Fuel Pump	18. 給水泵浦	Feed Water Pump
07. 噴燃加熱器	Fuel Heating Tube	19. 軟水槽	Soft-Water Tank
08. 排放閥	Discharge Valve	20. 藥注機	Dosing Pump
09. 水位計	Water Gauge	21. 藥液槽	Chemical Tank
10. Y型過濾器	Y-type Strainer	22. 軟水機	Soft-Water Conditioner
11. 電磁閥	Solenoid Valve	23. 加壓機	Water Booster Pump
12. 燃燒器	Burner	24. 壓力表	Pressure Gauge
		25. 壓力開關	Pressure Switch

給水管路 FEED WATER PIPELINE

燃油管路 FUEL PIPELINE

蒸氣管路 STEAM PIPELINE

藥液管路 CHEMICAL PIPELINE

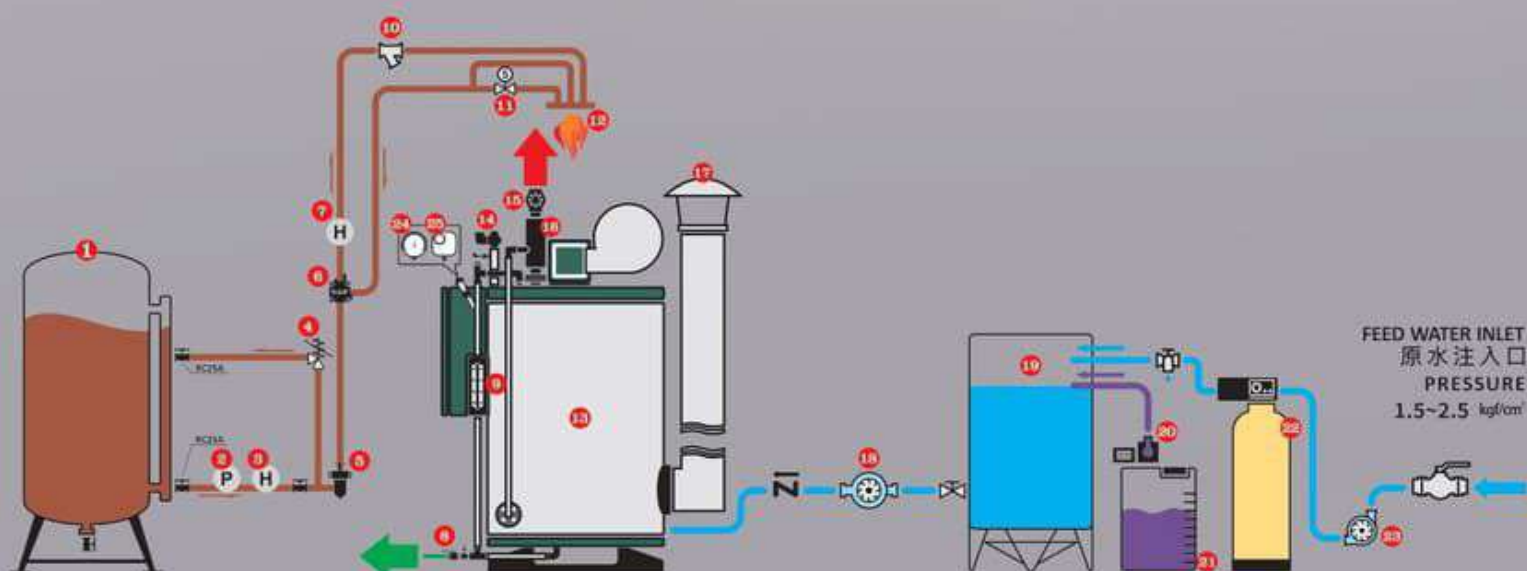
排水管路 DRAIN WATER PIPELINE





## 鍋爐房 Boiler Room

1. 可同時並聯多台鍋爐，提升工作效能。  
Boilers can be parallel connected to increase the production performance.
2. 提供專業完善的配管服務，讓空間整齊俐落同時大幅提升安全性。  
Provide professional and complete piping services to make the space neat and tidy while greatly improving safety.





指示說明  
Instructions

1. 狀態指示燈對照指示說明。

Status indicator and indicator instruction comparison.

狀態指示燈將鍋爐各種狀態簡化成簡單易懂的數字符號，對應指示說明文字，實現直覺操作性，清楚掌握鍋爐狀態。

The status indicator simplifies the complex status of the boiler into simple and easy to understand digital symbols. The instruction clearly corresponds to the status indicator enhancing the intuitive operability, controlling the boiler status at all times.



兩段式開關  
Two-Stage Switch

2. 兩段式開關同時具備安全性及簡易性。

Two-stage switch provides both safety and ease of use.

採用兩段式開關，分別控制運轉及燃燒功能。當燃燒出現異常時可緊急復歸，毋需斷電停工。

Two-stage switch design to controls "run" and "combustion". In case of abnormal combustion, the machine can be reset without cutting off the power.

狀態指示燈  
Status Indicator



0	給水停止 Feed water halt	0	燃燒停止 Combustion cease
1	給水 Feed water	1	油溫低下(重油) Temperature drop(Heavy)
2	低水位 Lower water level	2	送風 Draft
3	液面控制異常 Water level controller is abnormal	3	點火 Ignition
4	給水量不足 Feed water insufficient	4	低燃燒 Low combustion
5	空燒 Idle combustion	5	高燃燒 High combustion
6	馬達異常 Pump is abnormal	6	不著火 Misfiring



此面板為標配機種，可依需求選配人機介面系統。  
This panel is for a standard model, a human-machine interface system is also available.

啟動 START



約10~16秒後即點火  
The ignition happens approximately 10~16 secs after switched on.

自動運轉，維持蒸汽穩定輸出  
The boiler self-operates afterward and continuously provides stable steam.

燃燒復歸 COMBUSTION RESET





燃燒、蒸汽壓力及水位均**全自動控制**，設有多樣化的安全保護措施，提升鍋爐的安全性及使用壽命。

The combustion, steam pressure and water level are all automatically controlled. Equipped with diversified safety protection measures to improve the safety and service life of the boiler.

## 程式控制 Program Control

### • 程式控制器

採用插拔式接口，維修保養容易，有效減少停工待料之發生。

Program controller:

The plug-in interface is adopted, which is easy to repair and maintain, effectively reducing the occurrence of downtime.

電腦控制  
Computer controlled

自動檢測  
Automatic inspection

安全運轉  
Safe operation

**免專業人員判定故障位置**

No professionals needed to determine the location of the fault.

## 爐水控制 Boiler Water Control

### • 給水量不足檢知

微電腦自行運算檢知，有效防止鍋爐無水空燒，並且在水泵故障退化前及時報知。

Water insufficiency Inspector:

Self-examined by the Microcomputer; effectively prevent idle combustion and report promptly before the failure of the pump is degraded.

### • 水位控制異常檢知

微電腦自我診斷，防止水位電極棒斷線、短路或因水垢附著而產生的故障。

Water Level Control Error Inspecting:

Self-examined by the Microcomputer; efficiently prevent disconnection of water-level electrode rods, short cuts or operation faults caused by scale coherence.

## 溫度控制 Temperature Control

### • 爐體溫度偵測器

隨時偵測蒸氣溫度，當溫度超出設定值時自動斷電停機。

Boiler Body Temperature Sensor:

The sensor helps to check the steam temperature. When the temperature exceeds the set value, the boiler would self deenergizing.

### • 水管溫度偵測

隨時檢測鍋爐是否有產生水垢，若偵測到溫度上升至設定溫度時，鍋爐自動停止運轉。

Water Tube Temperature Sensor:

Examine whether water has scaled in boiler any time. If the temperature reaches to the set value, the boiler will stop its operation automatically.

## 蒸汽控制 Steam Control

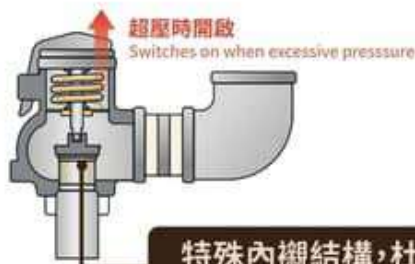
### • 全量式安全閥

吹洩量足夠、穩定性高，防止鍋爐內部壓力超過限度而爆裂。

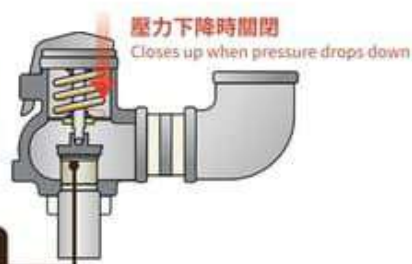
Full Bore Safety Valve:

Sufficient blow-off volume, high stability. Prevents the internal pressure of the boiler from bursting and prevents gas leakage.

蒸汽超壓  
Steam overpressure



蒸汽洩漏  
Steam leak



**特殊內襯結構，杜絕洩漏情形**  
Special lining structure to prevent leakage

## 燃料控制 Fuel Control

### • 噴槍

具有防漏及快速均衡油溫及預熱功能，燃燒時無黑煙產生。

Nozzles:

Include leaking-proof, fast balancing oil temperature and preheat functions, no black smoke would be produced when burning.

### • 重油電磁閥

採用瑞士製Lucifer，重油專用電磁閥作動正確，確保運轉之安全。

Heavy Oil Solenoid Valve:

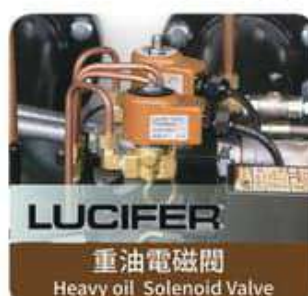
Use Switzerland made Lucifer. Safety is guaranteed when the heavy oil solenoid valve is operating correctly.

### • 油溫顯示

可隨時掌握燃油溫度，藉由油溫的調整與燃燒的狀況，可判定油品的優劣，當燃燒系統異常時，易判斷鍋爐異常狀況。

Oil-temperature display:

Use to control oil temperature. Oil quality can be known according to the oil temperature adjustment and burning condition. When the burning system malfunctioned, boiler status can be easily defined.








# 鍋爐效率性能&標準規格 BOILER PERFORMANCE & STANDARD SPECIFICATIONS

項目ITEM		型式MODEL	ZH-300H	ZH-300HE	ZH-400H	ZH-400HE	ZH-500H	ZH-500HE	
性能 PERFORMANCE	換算蒸發量 EQUIVALENT OUTPUT	Kg/h	300		400		500		
	發生熱量 HEAT OUTPUT	Kcal/h	162000		216000		269000		
	傳熱面積 HEATING SURFACE AREA	m <sup>2</sup>	5.4		6.0		8.3		
	最高壓力 MAX.PRESSURE	Kgf/cm <sup>2</sup>	10		10		10		
	保有水量 WATER CONTENT	L	88		98		133		
	鍋爐效率 BOILER EFFICIENCY	%	85	92	85	92	85	92	
	給水預熱器 WATER PREHEATER	/	N	Y	N	Y	N	Y	
	燃燒方式 COMBUSTION TYPE	/	ON-OFF		ON-OFF		ON-OFF		
	燃料消耗量 FUEL CONSUMPTION	l/h	B21.4	B19.8	B28.5	B26.4	B35.5	B32.8	
			C20.6	C19.0	C27.4	C25.4	C34.2	C31.6	
	本體設備電力 ELECTRICAL POWERCAPACITY	kw	5.75		6.1		6.85		
	輔機電力 POWER OF AUXILIARY EQUIPMENTS	給水泵馬達 WATER PUMP MOTOR	kw	0.75		0.75		1.5	
		送風機馬達 EXHAUSTING FAN MOTOR		0.4		0.75		0.75	
噴燃泵馬達 INJECTION PUMP MOTOR		0.4		0.4		0.4			
控制盤 CONTROL PANEL		0.2		0.2		0.2			
電器加熱器 ELECTIC-HEATER		4.0		4.0		4.0			
製品重量 PRODUCT WEIGHT	kg	720	820	750	850	1020	1170		
接管口徑 PIPE DIAMETERS	燃料入口管徑 FUEL INLET DIA	mm	15		15		15		
	給水入口管徑 FEED WATER INLET DIA		20		20		25		
	蒸汽出口管徑 STEAM OUTLET DIA		25		25		32		
	爐水排放管徑 BOILING-WATER DRAIN DIA		25		25		25		
	安全閥管徑 SAFETY VALVE DIA		20		20		25		
	自動排放管徑 AUTO BLOWDOWN DIA		/		/		/		
	煙窗外徑 CHIMNEY DIA		φmm	200		200		250	
引入電源線徑 POWER WIRE INLET DIA	mm <sup>2</sup>	5.5		5.5		5.5			
尺寸 SIZE	鍋爐尺寸 BOILER DIMENSIONS	長 LENGTH	1279	1477	1279	1477	1510	1668	
		寬 WIDTH	856	856	856	856	1098	1098	
		高 HEIGHT	1813	1813	2010	2010	2125	2125	



1. ZH-xxxx H 代表重油鍋爐。
2. 供應電源為 三相 / 220V / 60HZ 標準品，電源異動請另行通知。
3. 燃料低位發熱量：B重油 為 8910 kcal / l · C重油 為 9260 kcal / l ·
4. 產品因改良需要，亦可做部份修改，不另行通知。
5. 鍋爐效率之誤差容許值為 ±1%。



ZH-600H		ZH-600HE		ZH-750H		ZH-750HE		ZH-1000HE		ZH-1000HF		ZH-1500HE		ZH-1500HF		ZH-2000HE		ZH-2000HF			
600		750		1000		1500		2000													
323000		404300		539000		808000		1080000													
9.2		9.5		9.9		9.9		9.9													
10		10		10		10		10													
145		159		176		176		163													
85	92	85	92	90	93	90	93	90	93	90	93	90	93	90	93	90	93	90	93		
N	Y	N	Y	Y		Y		Y													
ON-OFF		TWO-STAGE		TWO-STAGE		TWO-STAGE		TWO-STAGE													
B42.6	B39.4	B53.4	B49.3	B67.2	B65.0	B100.8	B97.5	B134.7	B130.3												
C41.0	C37.9	C51.4	C47.5	C64.7	C62.6	C97.0	C93.8	C129.6	C125.4												
7.6		9.6		10.3		16.3		20.6													
1.5		1.5		1.5		2.2		4.5													
1.5		1.5		2.2		5.5		7.5													
0.4		0.4		0.4		0.4		0.4													
0.2		0.2		0.2		0.2		0.2													
4.0		6.0		6.0		8.0		8.0													
1060	1210	1170	1352	1460	1890	1856	2278	2050	2392												
15		25		25		25		25													
25		25		25		25		40													
32		40		50		50		65													
25		25		25		25		25													
25		25		32		40		40													
/		/		10		10		10													
250		290		330		360		360													
8		8		14		22		22													
1510	1668	1392	1585	1730	1890	1983	1863	1983	1863	1983	1863	1983	1863	1983	1863	1983	1863	1983	1863		
1098	1098	1148	1188	1479	1479	1902	1902	1908	1908	1908	1908	1908	1908	1908	1908	1908	1908	1908	1908		
2222	2222	2305	2305	2310	2310	2305	2305	2370	2370	2370	2370	2370	2370	2370	2370	2370	2370	2370	2370		
																					



- ZH- xxxx H indicates Heavy Oil boiler.
- Standard power is 3-Phase / 220V / 60HZ. Notice of change, if any, is required.
- Fuel consumption is calculated at low heat value: B heavy oil = 8910 kcal / l, C heavy oil = 9260 kcal / l.
- Partial modification for improvement is allowed without notice.
- Boiler efficiency tolerance value  $\pm 1\%$ .



## 服務團隊 SERVICE TEAM

本公司是專業的鍋爐製造廠，如有任何需求歡迎與我們聯絡。  
ZU HOW Industry is a professional boiler manufacturer.  
Please do not hesitate to contact us with any inquiry.



志豪官方網站

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