

選配

01



光學尺定位模組
-操作方便、快速，長度調整更為精準
-可檢測工件長度

02



變頻器
-可調整主軸轉速
-節省主軸啟動耗能
-傳動系統壽命延長

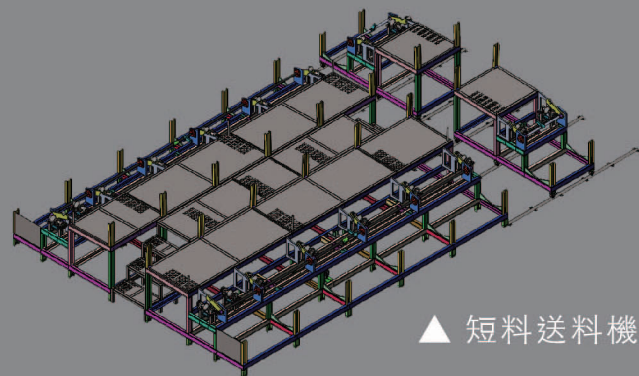
03



安全光幕
-保護操作人員人身安全

04

機械全罩式安全護罩
-標準配備為簡易安全門



▲ 短料送料機

05



彈性筒夾
-高精度，高轉速及高剛性結構

06



電控箱散熱
-標記風扇
-可升級熱交換器/冷氣

07

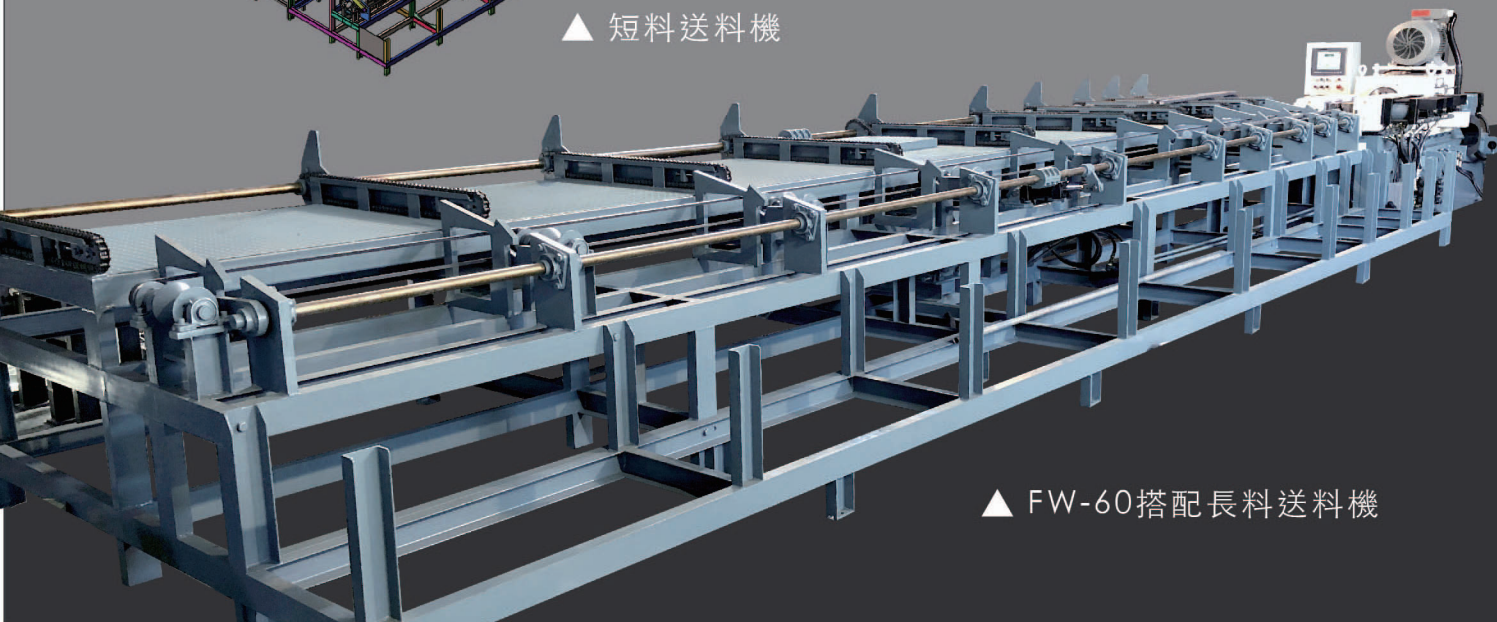


旋轉角度定位
-兩端工件在熔接後可停在特定角度

08



切屑系統
-可增加切屑系統
-伺服馬達切屑
(簡易PLC控制或CNC程式控制)



▲ FW-60搭配長料送料機

機械規格

項目/型號			DH-FW30	DH-FW45	DH-FW60
焊接能力	圓棒直徑		Ø9 ~ Ø25	Ø9 ~ Ø36	Ø9 ~ Ø60
	管件		Ø16	Ø48.3	Ø88.9
	最大旋轉側材料長度		300 mm	300 mm	300 mm
	固定側材料長度		9m	9m	9m
最大推力	摩擦加熱時		8,000 Kg	10,000 Kg	12,000 Kg
	鍛造加壓時		16,000 Kg	20,000 Kg	26,000 Kg
旋轉主軸	主軸旋轉數	50Hz	3000 rpm	2250 rpm	1780 rpm
		60Hz	2500 rpm	1780 rpm	1570 rpm
	離合器	方向	濕式多板電磁離合器		
		轉距	800 (N.m)	800 (N.m)	1600 (N.m)
	制動器	方向	濕式多板油壓制動器		
		動態轉距	800 (N.m)	800 (N.m)	1600 (N.m)
	制動時間		0.3 sec	0.3 sec	0.3 sec
	主軸夾具		油壓三爪6" / (油壓筒夾)	油壓三爪8" / (油壓筒夾)	油壓三爪10" / (油壓筒夾)
滑台移動速度	快速移動速度		20 m/min	20 m/min	20 m/min
	加工移動速度		1~1000 mm/min	1~1000 mm/min	1~1000 mm/min
	最大移動距離		150 mm	200 mm	250 mm
工件夾持方式	虎鉗夾板方式		水平雙開同步夾具		
	夾持力		8,600 Kg	17,000 Kg	25,000 Kg
加工方式	尺寸調整		0 ~ 100 mm	0 ~ 100 mm	0 ~ 100 mm
	時間調整		0 ~ 999 秒	0 ~ 999 秒	0 ~ 999 秒
馬達功率	主軸用		22 kw	30 kw	37 kw
	油壓用		5 kw	9 kw	9 kw
	伺服馬達		7 kw	9 kw	11 kw
	油壓油溫度冷卻系統		1.5T / 1.1 Kw	2T / 2 Kw	2T / 2 Kw
機器規格	機台尺寸		2750 x 2800 x 2000	2750 x 3100 x 2000	2750 x 3400 x 2000
	機台重量		6,000 Kg	6,800 Kg	7,300 Kg



達鴻機械
DARHUNG
MACHINERY CO., LTD.

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通過 ISO 9001 品質管理系統



達鴻機械
DARHUNG
MACHINERY CO., LTD.

FW SERIES 摩擦焊接機



- 較傳統車牙成型速度快5倍
- 全自動化生產，產量提升、降低人力
- 熔接後強度高於母材，適用各式續接器
- 利用接觸面高速摩擦，無需焊條或額外加熱
- 廣泛應用於基礎建設、高科技廠房、摩天大樓等

DH-FW30/45/60

摩擦焊接-原理

摩擦熔接是一種「固態」熔接方法，通過機械摩擦轉動及軸向壓力，使摩擦表面產生熱量以致材料處於半熔化狀態，再將工件施以壓力，將同種或異種金屬牢固熔接為一體。

為了建立低碳社會，需要在焊接過程中盡可能節省能量。通過降低熱量輸入，接頭處的材料不會產生飛濺物或煙霧。不需要額外的材料或填料，為您的製造領域帶來新的革命。

摩擦焊接-特性

01 [獨特的焊接功能]

焊接面為金屬兩端面熔在一起，連結點具有強韌性，其抗拉伸及抗扭力之強度遠超過電弧焊接與氬弧焊接之強度。

02 [加入異種材料能降低材料成本]

傳統焊接不能兼容的金屬組合可通過摩擦焊接進行連接。能節省大量成本，作為輕量化元件的一種應用方式。

03 [提升焊接精準度]

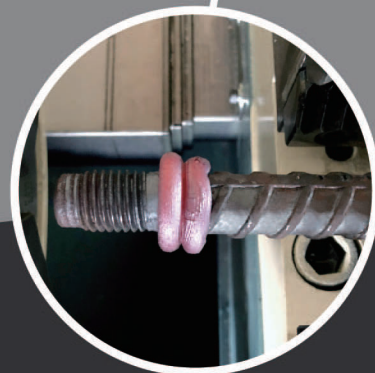
焊接後兩端材質不易變形，中心偏心公差0.5mm以內，確保工件品質可減少加工預留量，可降低材料與加工成本。

04 [生態友好和高效節能]

不用燃料或填充金屬、溶劑、氣體等耗材，以接觸面摩擦產生均勻的熱量。無電弧或有毒物，能有效改善工作環境。

05 [更快更精準的焊接效率]

使用摩擦焊接加工的生產成本比鍛造成本低，可快速成形，其強度不亞於鍛造品，表面更乾淨。



FW系列優勢

01 使用最新**伺服驅動**，移位更準確

02 自由且**可快速移動移位速度**

03 **不隨油溫影響出力**

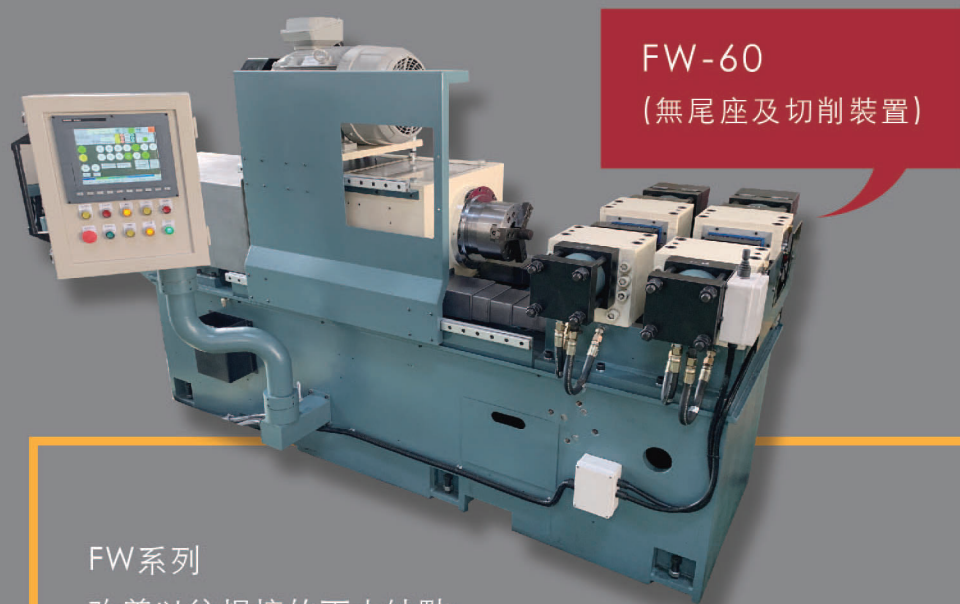
04 **全觸控面板**可靈活更動，自由度高

05 **可附切削裝置**，自動切削廢屑

06 使用各國知名品牌零件，**精度更準確**

07 比傳統車牙成型速度**快5倍**

08 **全自動化**生產，產量提升、降低人力



FW-60
(無尾座及切削裝置)

FW系列
改善以往焊接的兩大缺點：

[飛濺物]

氣體焊接和電弧焊時飛散的細小顆粒。它們導致塗層缺陷並對質量有不利影響，在焊接中經常會看到大量飛濺物散射，這會削弱電極的壓力，成為焊接質量不佳的原因。

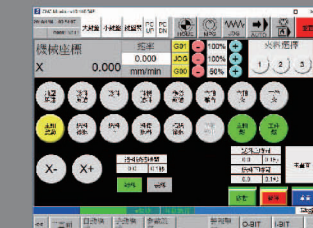
[煙]

焊接過程中發生的金屬蒸氣，並凝聚成微細顆粒。長時間吸入煙霧會引起稱為金屬煙霧熱的症狀。其他症狀包括咳嗽、胸悶、口渴和發燒，有時會導致肺水腫。



焊接過程

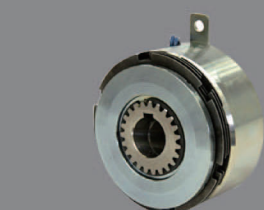
1. 兩側工件定位，滑台夾緊工件前進，開始摩擦焊接
2. 焊接完成，夾具放鬆後退，取出工件
3. 兩側高速旋轉施壓，使兩工件緊密結合



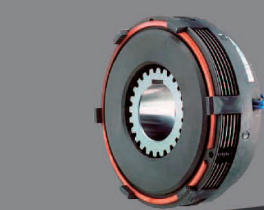
▲ 全觸控面板控制系統



▲ 伺服馬達



▲ 濕式多板電磁離合器



▲ 濕式多板油壓制動器

拉力測試

利用CNC車製摩擦運動產生熱能，在真空熱狀態下施以軸向壓力塑合續接器及鋼筋母材。



內部分子結構於摩擦焊接後完全結合，合金相組織完整。

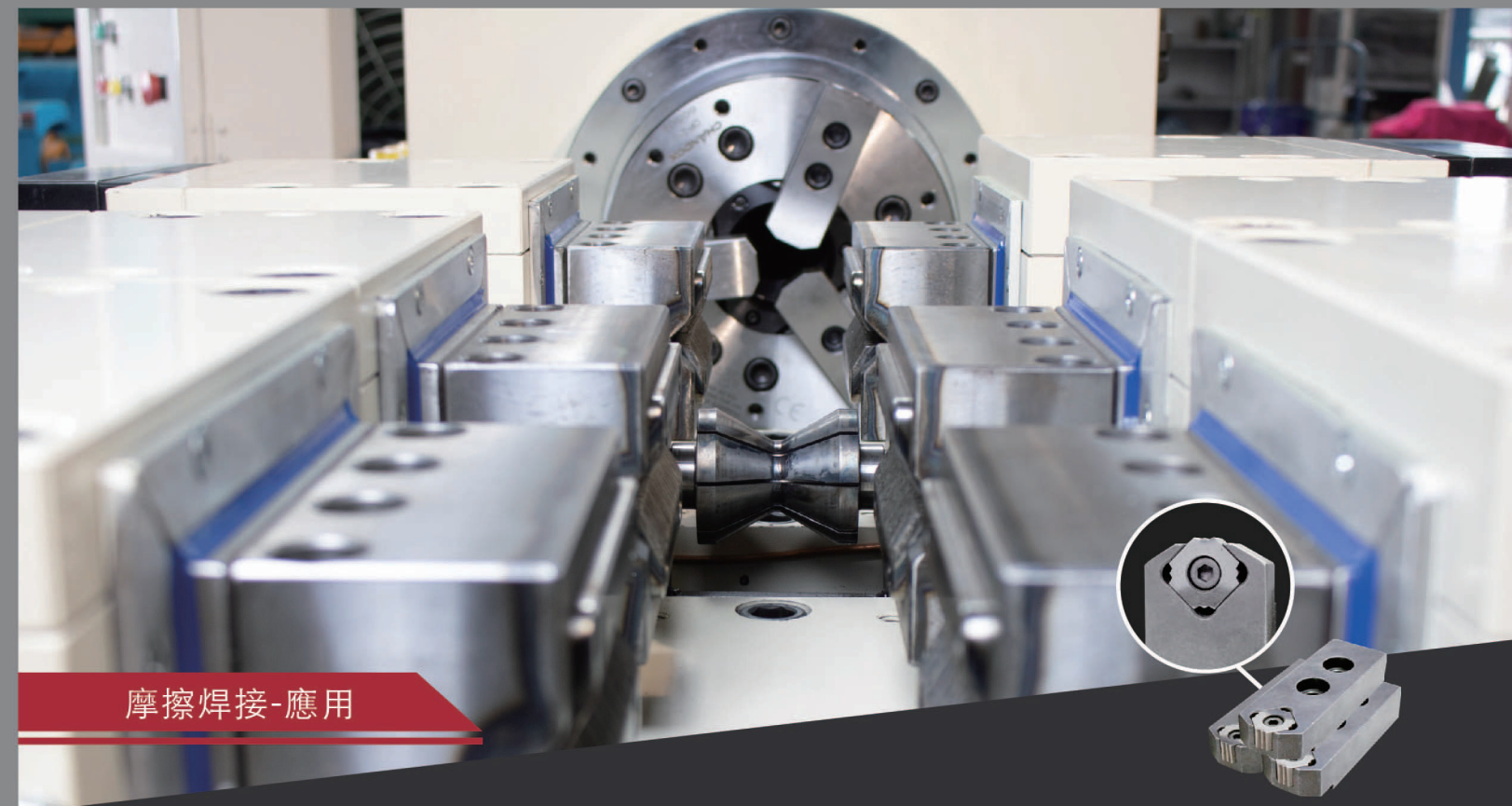


接合後續接器強度優於母材，拉伸試驗完全斷筋。



接合點保有原材質特性，強度不影響原材質特性，可有效傳遞應力。

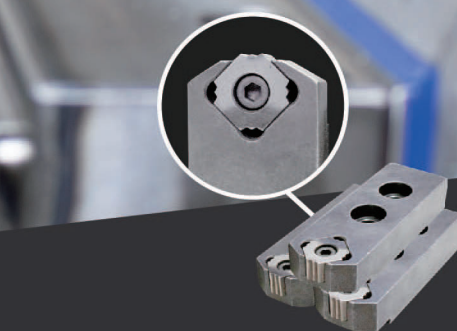
採10組SD420W可焊鋼筋進行SA級拉力試驗，試驗結果均高於規範值。



摩擦焊接-應用

摩擦焊接通常用於製造工業、材料處理設備以及汽車、航空航天、船舶和石油業所需的部件。其他細項包括齒輪、軸管、動力傳動系統、閥門、液壓活塞桿、泵軸、鑽頭、連桿等。在建築和農業行業開發方面也相對擁有豐富的應用。

摩擦焊接也用於熱塑性塑料，它在熱和壓力作用下類似於金屬。這些材料使用的熱量和壓力遠遠低於金屬，但該技術可用於金屬與塑料的接合，金屬界面經過機械加工。例如，該技術可用於將眼鏡框架連接到鉸鏈中的銷釘。使用的較低的能量和壓力允許使用更多種技術。



▲ 活動生爪
可替換式夾爪



▲ 鋼筋續接器

Optional



- 01
- Optical scale positioning module
 - Easy and fast operation, precise length adjustment
 - Detectable work piece length

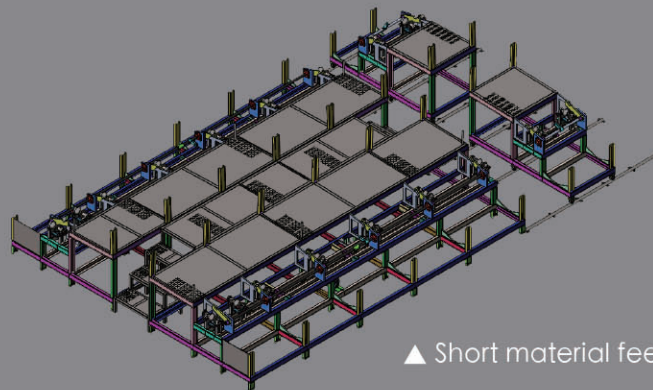


- 02
- Inverter
 - Adjustable spindle speed
 - Save spindle start energy consumption
 - Extended service life



- 03
- Safety Sensor
 - Protecting the operators safety.

- 04
- Mechanical full cover safety guard
 - Standard equipped with simple safety doors



▲ Short material feeder



- 05
- Chip Breaking system
 - Cutting Device
 - Servo Motor Chips
 - (Simple PLC Control or CNC Program Control)



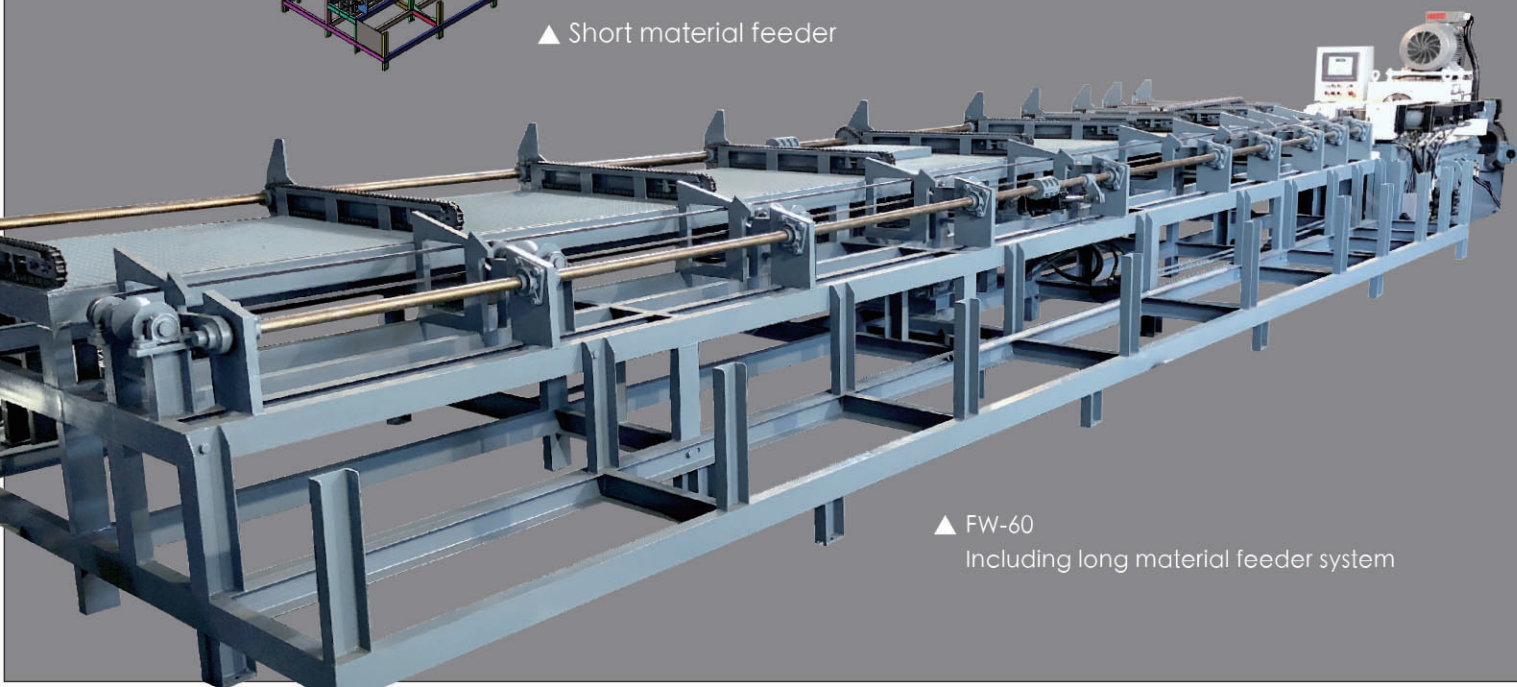
- 06
- Electric control box cooling system
 - Standard original fan
 - Upgradeable the heat exchanger or air conditioner.



- 07
- Retractable collet
 - High precision
 - High speed
 - High rigidity structure



- 08
- Rotary angle positioning
 - Both ends of the work piece after welding can be stopped at certain angles



▲ FW-60
Including long material feeder system

Machine specifications

Machine specifications			DH-FW30	DH-FW45	DH-FW60
Welding ability	Round rod diameter		Ø9 ~ Ø25	Ø15 ~ Ø36	Ø20 ~ Ø60
	Pipe Fittings		Ø16	Ø48.3	Ø88.9
	The Max. length of the rotating side		300mm	300mm	300mm
	The length of the fixed side		9m	9m	9m
Maximum thrust	Frictional heating time		8,000 Kg	10,000 Kg	12,000 Kg
	Forging pressurization		16,000 Kg	20,000 Kg	26,000 Kg
Spindle	Number of spindle rotation	50Hz	3000 rpm	2250 rpm	1780 rpm
		60Hz	2500 rpm	1780 rpm	1570 rpm
	Clutch	Direction	Oil Actuated Multi-Disc Clutch and Brake		
		Torque	800 (N.m)	800 (N.m)	1600 (N.m)
	Brakes system	Direction	Oil Actuated Multi- plate hydraulic Brake		
		Dynamic torque	800 (N.m)	800 (N.m)	1600 (N.m)
	Braking time		0.3 sec	0.3 sec	0.3 sec
	Spindle fixture		Hydraulic three-jaw 6" / (Hydraulic pressure)	Hydraulic three-jaw 8" / (Hydraulic pressure)	Hydraulic three-jaw 10" / (Hydraulic pressure)
Slide speed	Rapid traverse rate		20 m/min	20 m/min	20 m/min
	Machine Processing speed		1~1000 mm/min	1~1000 mm/min	1~1000 mm/min
	The Max. moving distance		150 mm	200 mm	250 mm
Work piece clamping manner	Vise splint method		Horizontal double-open synchronous fixture		
	Clamping force		8,600 Kg	17,000 Kg	25,000 Kg
Processing methods	Size adjustment		0 ~ 100 mm	0 ~ 100 mm	0 ~ 100 mm
	Time adjustment		0 ~ 999 s	0 ~ 999 s	0 ~ 999 s
Motor power	Spindle		22 kw	30 kw	37 kw
	Hydraulic pressure		5 kw	9 kw	9 kw
	Servo motors		7 kw	9 kw	11 kw
	Hydraulic oil temperature cooling system		1.5T / 1.1 Kw	2T / 2 Kw	2T / 2 Kw
Dimension	Machine Dimensions		2750 x 2800 x 2000	2750 x 3100 x 2000	2750 x 3400 x 2000
	Machine weight		6,000 Kg	6,800 Kg	7,300 Kg



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Passed the ISO 9001,
Quality Management System



FW SERIES
Friction welding machine



- Fully automated production line:
- Increase production
- Reduce manpower
- After welding, the strength is higher than that of the base metal, and suitable for all kinds of connectors continued
- 5 times faster than compared to traditional machine
- With high friction at the contact surface, and No need electrode or extra heating and welding.
- Widely used in infrastructure construction, High-tech factory building, Skyscrapers, etc.

DH-FW30/45/60

Friction welding-Principle

Friction welding is a kind of "solid state" welding method. Through mechanical frictional rotation and axial pressure, heat is generated on the friction surface so that the material is in a semi-molten state, and then the workpiece is subjected to pressure to firmly fuse the same or dissimilar metals into one.

In order to build a low-carbon society, it is necessary to save energy as much as possible during welding. By reducing the heat input, the material at the joint does not produce splashes or fumes. No additional materials or fillers are needed, creating a new revolution in your manufacturing area.

Friction welding-Features

01 [Unique welding function]

The welding surface is melted together at both ends of the metal, and the connecting point is strong and tough, and the strength of tensile and torsional resistance far exceeds the strength of arc welding and argon welding.

02 [Adding dissimilar materials can reduce material costs]

Traditional welding incompatible metal combinations can be connected by friction welding. It can save a lot of cost and is an application method of lightweight components.

03 [Improve welding accuracy]

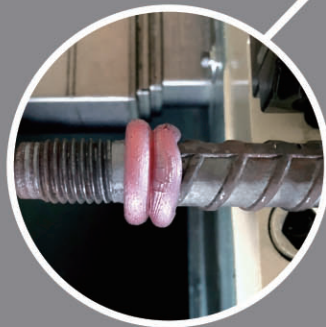
After welding, the materials at both ends are not easily deformed, Center eccentricity difference within 0.5mm. To ensure the quality of the work piece can reduce the processing reservation, Can reduce materials and processing costs.

04 [Eco-friendly and energy-efficient]

It does not require the use of expendable materials such as fuels or metal-filled solvents, gases, etc., and generates uniform heat with friction between the contact surfaces, so there is no arc or toxic material to improve the working environment.

05 [Faster and more precise welding efficiency]

The cost of production using friction welding is lower than that of forging, also it can be formed quickly. However, the strength is not less than of forged products, and the surface is cleaner.



FW series advantages

01 Using the latest servo drive, shift more accurate

02 Freedom of movement and can quickly shift speed

03 Full touch panel can be flexible modifier, the degree of freedom

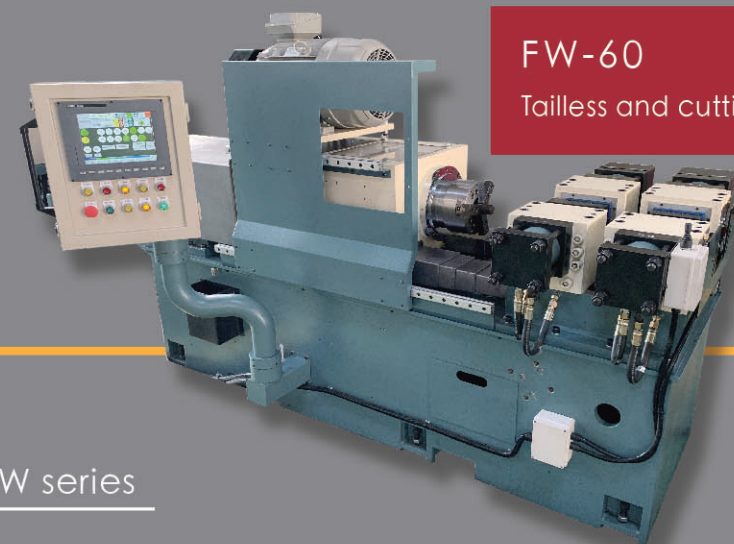
04 Fully automated production, increase production, reduce manpower

05 Using the famous brand parts of best countries, Accuracy is more accurate

06 5 times faster than compared to traditional machine

07 Does not affect the oil temperature

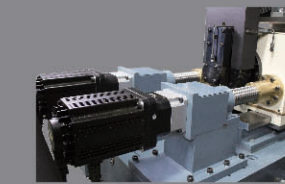
08 Friction welding with Automatic cutting device



FW-60
Tailless and cutting devices



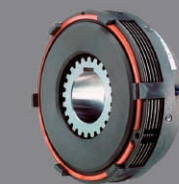
▲ Full touch panel control system



▲ Servo motor



▲ Servo motor



▲ Oil Actuated Multi-plate hydraulic brake

FW series

Improve the two major shortcomings of previous welding:

[Splashes]

When scattering of arc welding gas and electricity fine particles. They cause defects in the coating and adversely affect the quality. In the welding, it is often seen that a large amount of spatter scatters, which weakens the pressure of the electrode and causes poor welding quality.

[Smoke]

Metal vapors that occur during the welding process and condense into fine particles. Prolonged inhalation of smoke can cause symptoms called metal fume fever. Other symptoms include coughing, chest tightness, thirst, and fever, which can sometimes cause pulmonary edema.

Welding process

1. Positioning the work pieces on both sides, clamping the work piece with the slide table, and starting friction welding
2. After the welding is completed, the fixture is released and the work piece is removed.
3. High-speed rotation on both sides of the pressure, so that the two parts are closely integrated

Pull test

Using the CNC system to generate heat energy from frictional motion. The axial pressure applied in the hot state under vacuum resumed plastic composite connectors and steel base metal.



Internal molecular structure after the friction welding fully incorporated flask complete.

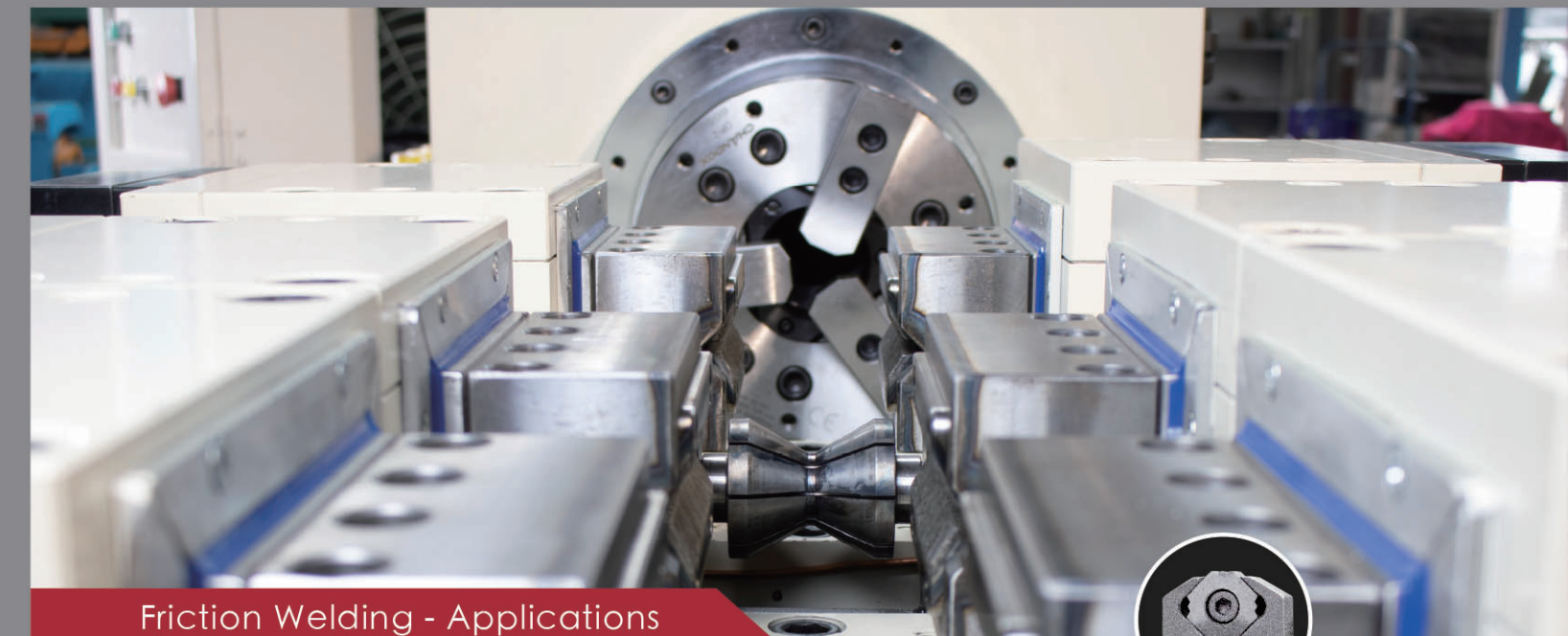


Subsequent joint strength is better than that of the base metal, and the tensile test completely breaks the ribs.



Retain the original joint material toughness, strength, without affecting the original material properties, which can effectively transfer stress

Ten sets of SD420W weldable steel bars were used to perform SA-grade tensile tests. The test results were all higher than the specifications.



Friction Welding - Applications

Friction welding is commonly used in manufacturing industries, materials handling equipment, and parts needed for the automotive, aerospace, marine, and petroleum industries.

Other breakdown includes a gear, shaft tube, powertrain, valves, hydraulic piston, the shaft, the drill bit and connecting rods.

There are also relatively abundant applications in the development of the construction and agricultural industries.

Friction welding is also used in thermoplastics, which are similar to metals under heat and pressure.

These materials use far less heat and pressure than metals, but the technology can be used to join metals and plastics. The metal interface is machined.

For example, this technique can be used to connect eyeglass frames to pins in a hinge. The use of lower energy and pressure allows the use of more technologies.



▲ Activity jaws
Replaceable jaws



▲ Reinforced splicer