

战略性全国布局, 构建富有竞争力的业务体系, 为您提供快捷的就近服务

Our nationwide layout, to build a competitive business system, to provide you with fast service nearby



北京丰台科技园 / 集团总部

- 河北固安: 北区研发制造基地
- 重庆北碚: 辐射西南地区
- 江苏昆山: 辐射长三角地区
- 泰国北榄府(拟规划): 辐射东南亚地区
- 广东东莞: 辐射珠三角地区

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小核心 大产业

搅拌摩擦焊专家

EXPERTISE IN FSW SOLUTION

帮助客户从容应对有色金属搅拌摩擦焊接工业需求
 Helping our customers coping with industrial needs for non-ferrous metal in FSW solutions



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搅拌摩擦焊技术广泛应用于航空、航天、船舶、轨道交通、汽车、兵器、电力电子、冶炼、民用建筑等领域
 Widely used in aviation, aerospace, ships, rail transport, automobiles, weapons, power electronics, smelting, civil construction and other fields.



关于我们

About Us

北京世佳博科技集团有限公司 2014 年成立于北京，立足中国，服务全球市场。在河北固安、江苏昆山、重庆北碚、广东东莞设有分公司，拥有经验丰富的搅拌摩擦焊接专家团队、省级工业企业技术研发中心，是搅拌摩擦焊细分领域全球知名的“整体解决方案”提供商，是“国家高新技术”企业、“中关村高新技术”企业、北京市“专精特新”示范企业、国家级“先进工业母机”制造企业、省级“知识产权管理体系”贯标企业。

Beijing Sooncable Technology Group Co., Ltd (Sooncable), was established in Beijing in 2014, based in China and serving the global FSW market. We have branches in Gu'an, Hebei, Jiangsu, Chongqing and Guangdong. The company has an experienced team of friction stir welding experts, “Provincial industrial enterprise accreditation” technology research and Development Center.

Sooncable is a world famous expertise in Friction Stir Welding solution. Besides, Sooncable is "national high-tech", "Zhongguancun high-tech", "Specialized special new high-quality", Intellectual Property Management System Certification and enterprise, else.

公司在搅拌摩擦焊接领域、散热技术领域、大型机械装备制造领域、金属材料加工、有色金属材料成型等领域拥有丰富经验，可为来自航空、航天、船舶、轨道交通、汽车、兵器、电力电子、冶炼、民用建筑等领域客户提供快捷高效的搅拌摩擦焊接服务。

Sooncable has rich experience in the field of Friction Stir Welding, heat dissipation technology, large-scale mechanical equipment manufacturing, metal material processing, non-ferrous metal.



2014

成立
Foundation

北京

总部
Headquarter

22,000+

厂房面积
Plant Area

5

生产基地
Production Base

1,400+

交付设备
Machine Delivery

4,000+

服务客户
Customers

企业文化

Our Culture

愿景

提高公司搅拌摩擦焊接技术专业服务水平，成为国际一流的搅拌摩擦焊接“整体解决方案”提供商
Improve our professional service capacity of Friction Stir Welding technology, and become the world's first-class FSW "overall solution" provider

使命

提高搅拌摩擦焊接技术的工业使用率，成为搅拌摩擦焊接技术标准的倡导者、践行者和建设者
Improve the industrial utilization rate of Friction Stir Welding technology, and become the advocator, practitioner and builder of FSW technology standard

立企之本

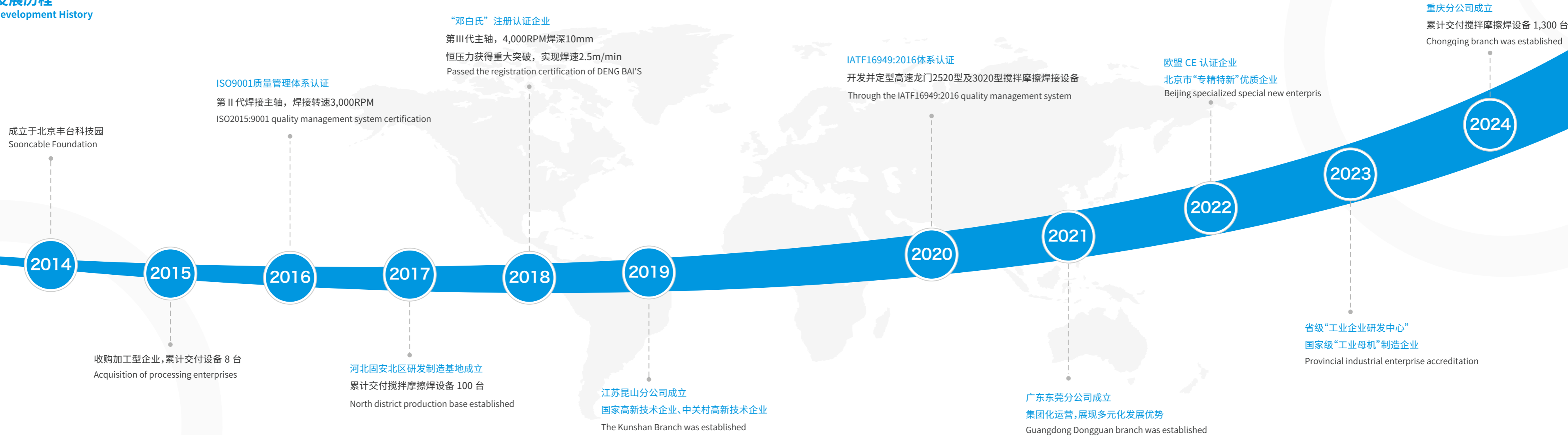
实现客户产品升值、实现员工企业价值、实现股东资产增值
To achieve the appreciation of our customer products, enterprise value of Sooncable as well as assets accretion of our shareholders

价值观

诚信正直、合作共赢、严谨务实、激情创新
Customer first, team-work, integrity, passion for innovation



发展历程 Development History



资质荣誉&知识产权 Honor And Qualification

资质 Qualification



2019年10月通过国家“高新技术企业”认定
 2019年11月通过北京“中关村高新技术企业”认定
 2022年5月通过“北京市专精特新企业”认定
 2022年11月通过“省级工业企业研发机构”认定
 2023年8月通过“工业设计中心”认定
 2023年11月通过“先进工业母机企业”认定

Sooncable passed the National "HI- TECH CERTIFICATION" in October 2019, and "ZHONGGUANCUN HI-TECH CERTIFICATION" in November 2019
 "BEIJING SPECIALIZED SPECIAL NEW ENTERPRISE" in May 2022
 "PROVINCIAL INDUSTRIAL ENTERPRISE ACCREDITATION" in November 2022
 "INDUSTRIAL DESIGN CENTER" in August 2023
 "INDUSTRIAL MOTHERSHIP" in November 2023



2015年通过 ISO9001: 2015 质量体系认证
 2018年通过邓白氏注册认证
 2020年通过并获得 IATF16949:2016 体系认证
 2022年通过欧盟 CE 体系认证
 2022年通过知识产权管理体系认证

Passed the ISO9001:2015 QUALITY SYSTEM CERTIFICATION
 Passed the registration certification of Deng Bai's in 2018
 Passed the certification system of IAFT16949:2016 CERTIFICATION in 2020
 Passed the CE certified of the European Union in 2022
 Passed the certification of intellectual property management system in 2022

知识产权&荣誉 Intellectual property rights and qualifications

技术驱动,集团及下属公司先后获得包括发明专利在内的数十项专利,并获得了丰厚的成果转化。
 Technology-driven, We have obtained many patents including invention patents, and has obtained rich achievements transformation.



战略布局 Business Layout

北京 Beijing

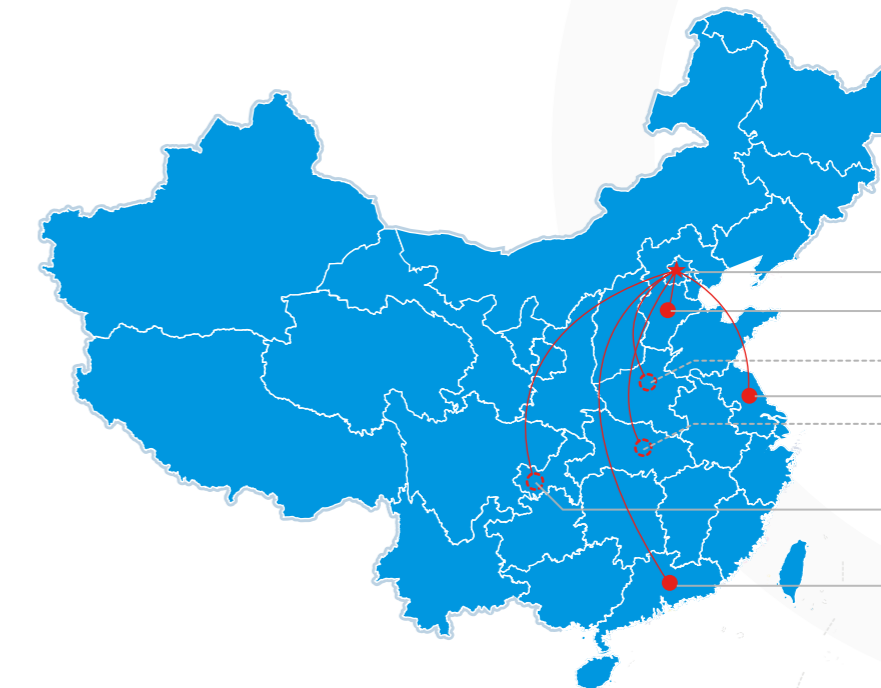
丰台科技园区 商务接待中心

依托北京丰台科技园区良好的区域配套条件及科技创新氛围，提供与搅拌摩擦焊接技术相关的配套服务。

Relying on the timely supporting advantage and innovating condition of Fengtai Hi-tech Park of Beijing, Sooncable engages in solving FSW solution.



1. 北京丰台
2. 河北固安
3. 河南郑州(拟规划)
4. 江苏昆山
5. 湖北武汉(拟规划)
6. 重庆北碚
7. 广东东莞



河北固安 Hebei Gu'an

北区研发制造基地

公司在河北固安（距离北京大兴机场 9 公里）建立北区设备制造基地。该基地占地面积约 12,000 平米，是集研发、制造、销售于一体的一站式服务中心。

Sooncable has the North district equipment manufacturing base in Hebei . Is a research and development, manufacturing, sales in one-stop service center.



江苏昆山 Jiangsu Kunshan

辐射长三角地区

公司在昆山市陆家镇建立分公司，该分公司占地面积约 2,600 平米，能够满足长三角地区客户售前参观、样品制造及售后服务。

Sooncable has built a branch company in Lujia Town, Kunshan City to serve customers in the south of China.



重庆北碚 Chongqing Beibei

辐射西南地区

公司在重庆北碚建立分公司，该分公司占地面积约 2,000 平米，能够满足西南地区客户售前参观、样品制造及售后服务。

Sooncable established a branch in Beibei Chongqing Province for FSW processing and after-sales support.



广东东莞 Guangdong Dongguan

辐射珠三角地区

公司在东莞松山湖工业园建立分公司，该分公司占地面积约 2,600 平米，能够满足珠三角地区客户售前参观，样品制造、批产加工及售后服务。

Sooncable established a branch in Dongguan, Guangdong Province for FSW processing and after-sales support.

公司业务

Business Sector

01 搅拌摩擦焊接设备

FSW Equipment

基于核心团队成员18年搅拌摩擦焊接机理研究特长，将搅拌摩擦焊接技术与精密机床紧密结合起来，秉持“做品牌，用好料”的设备制造初衷，为客户制造高精度、高可靠性、高使用性价比的搅拌摩擦焊接机床。

Based on our core team members on the research results for more than 18 years in Friction Stir Welding mechanism, combined with precision machine manufacture and with our original intention of "making brand and using good materials", we provide FSW machines with high precision, high reliability and high cost performance.

02 搅拌摩擦焊接产品

FSW Products

公司拥有高速、重载搅拌摩擦焊接设备38台，高精度数控加工设备69台，拥有车床、铣床、钻床等各类设备116台。公司在搅拌摩擦焊接领域、散热技术领域、金属材料加工领域、铝合金铸造成型领域拥有丰富经验，可为客户提供搅拌摩擦焊接加工、产品开发、产品OEM定制等服务。

We have 38 sets of high-speed, heavy-duty FSW equipment, 69 sets of high-precision CNC processing equipment, 116 sets of lathes, milling machines, drilling machines and other equipment. Also, we have rich experience in the field of Friction Stir Welding, heat dissipation technology, large-scale mechanical equipment manufacturing, metal material processing, non ferrous metal forming and other fields. Our business includes: FSW equipment manufacturing and sales, FSW product processing and OEM manufacturing, FSW tool development and sales, FSW technology development and technical training.

03 搅拌摩擦焊接工具

FSW Tools

公司将搅拌头、夹具作为重要产品予以发展，实现了搅拌头产品、夹具产品的专业化与标准化。公司组建了以搅拌摩擦焊接专家为核心的设计团队、精选进口原材料、采用高精度加工设备、严控热处理工艺，表面涂层及产品出厂检验流程，确保搅拌头产品性能优异。

We develop the FSW tools、 Fixture as the core products of our company, realizing the specialization and standardization of FSW tool products. Also, we have set up a design team with FSW experts and as the core member, select foreign pure imported raw materials, adopt high-precision production and processing equipment, strictly control the heat treatment process, surface coating, product packaging and product delivery inspection, so as to ensure the excellent performance of FSW tool products.

04 搅拌摩擦焊接技术服务

FSW Technical Services

搅拌摩擦焊接工艺是搅拌摩擦焊接技术的核心。公司先后研制成功重载大厚度、可回抽、双轴肩、静轴肩、超高速搅拌摩擦焊接设备。同时，在搅拌摩擦焊接共性技术开发、搅拌摩擦焊接产品应用开发以及搅拌摩擦焊接技术培训方面，可为客户提供专业的搅拌摩擦焊接整体解决方案。

Friction stir welding technology is the core of FSW method. At the same time, in the development of FSW common technology, we have successfully developed many kinds of FSW machine, such as Bobbin FSW, Static Shoulder FSW, Retrievable FSW and spot FSW technologies, etc. Besides, in the product application development and FSW technology training, we can also provide customers with professional FSW overall solutions.

搅拌摩擦焊接设备

FSW Equipment

搅拌摩擦焊接设备制造理念

Manufacturing Concept

高精度

Z轴独创性硬轨设计 | 采用一体铸造底座、工作台 | 设备定位精度不低于0.015mm/1,000mm

Low speed and high torque | FSW machine is under great stress | Shaft, lead screw, and bearing are the core parts

高可靠性

传动部件均为一线品牌 | 兼容并高效识别十几种绘图软件 | 基于西门子控制系统的搅拌摩擦焊专用系统

Z direction downforth | Requiring rigid support under parts | Parameters, speed and FSW tool are important

高使用性价比

实现6,000/4,000转主轴 | 焊接速度最快可达3,500mm/min | 一键启动—恒压力控制—铣焊一体—DNC系统

Z-axis runout influence performance | Accuracy of the equipment is bound to decline | Equipment can be used is the most basic demand



过程精准恒压力控制



过程一键启动



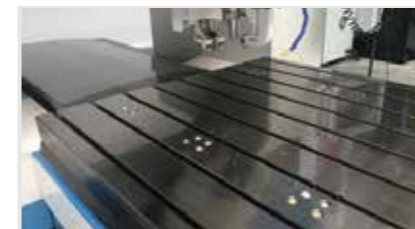
超高速焊接



焊接工艺高度适应性

搅拌摩擦焊接设备配置功能

Optional Functions



01 飞边铣削系统



02 电控系统空调系统



03 水雾冷却及回收系统



04 前导滚轮系统



05 急速气冷系统



06 恒压力控制系统



07 DNC 管理系统



08 机头自适应平衡系统

公司提供近10种配置及功能，分别为：急速气冷系统、电控系统空调系统、水雾冷却及回收系统、前导滚轮系统、飞边铣削系统、恒压力控制系统、DNC管理系统、系列化主轴以及机头自适应平衡系统、焊接矫形系统等。

Sooncable provides nearly 10 optional functions, including rapid air cooling system, electric control system, air conditioning system, water mist cooling and recovery system, leading roller system, flash milling system, constant pressure control system, DNC control system etc. The selection of functions and the time of function installation can solve all kinds of practical needs met in the production for customers, which is highly praised by customers.

搅拌摩擦焊接设备

FSW Equipment

设备属性

Device Properties



► 机床属性

低转速高扭矩 | 设备受力大,必须做得结实 | 主轴、丝杠、导轨、轴承是核心部件

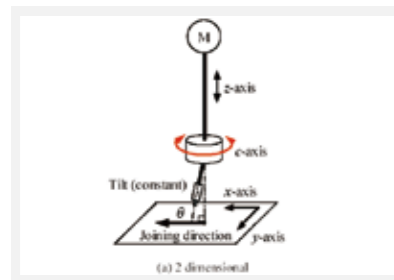
Low speed and high torque | FSW machine is under great stress | Shaft, lead screw, and bearing are the core parts



► 精密属性

Z轴跳动对焊缝性能影响大 | 设备长期使用精度必然会逐年下降 | 设备能用是最基本诉求,更应该好用、耐用

Z direction downforth | Requiring rigid support under parts | Parameters, speed and FSW tool are important



► 控制属性

5轴或5轴4联动设备 | 一键启动,过程无需人为干预 | 产品一致性好,且适应复杂工况的高速焊接

Z-axis runout influence performance | Accuracy of the equipment is bound to decline | Equipment can be used is the most basic demand

设备规格

Equipment Specification

结构	型号	工作台 (mm)	行程 (mm)	单面最大焊接厚度 (mm)		装配主轴
				铜 (Cu) _{3T} 及以上设备适用	铝 (Al)	
台式	SCB-TS650	600×500	500×400×400	3	6/8	2/3T
台式	SCB-TS850	800×500	600×500×450	3	6/8	2/3T
台式	SCB-HL850	800×500	600×500×350	3/6	8/12	3/6T
台式	SCB-TS1260	1,200×600	1,100×600×600	3	6/8/10	2/3T
台式	SCB-TS1890	1,800×900	1,600×900×600	3/6	6/8/12	2/3/4T
龙门式	SCB-LM980	900×800	800×800×400/600	3/6	8/10/12	3/6T
龙门式	SCB-LM1512	1,500×1,000	1,500×1,200×600	3/6	6/10/12/16	2/3/6T
龙门式	SCB-LM2520	2,500×1,600	2,600×1,800×500	3/6/10/15	6/10/16/25/30	2/3/6/10/13T
龙门式	SCB-LM3020	3,000×1,800	2,600×1,800×500	3/6/10/15	6/10/16/25/30	2/3/6/10/13T
龙门式	SCB-LM3022	3,000×2,000	3,000×2,000×600	3/6/10/15	6/10/16/25/30	2/3/6/10/13T
龙门式	SCB-LM3324	3,300×2,000	3,200×2,400×500	3/6/10/15	6/10/16/25/30	2/3/6/10/13T
龙门式	SCB-LM4027	4,000×2,500	4,000×2,700×500	3/6/10/15/18	6/10/16/25/30/40	2/3/6/10/13/15T
非标定制式	SCB-LM5221	5,200×1,800	5,200×2,100×500	3/6/10/15/18	6/10/16/25/30/40	2/3/6/10/13/15T
非标定制式	SCB-LM6014	6,000×1,000	6,000×1,200×500	3/6/10/15/18	6/10/16/25/30/40	2/3/6/10/13/15T
非标定制式	SCB-LM6027	6,000×2,500	6,000×2,700×500	3/6/10/15/18	6/10/16/25/30/40	2/3/6/10/13/15T
非标定制式	SCB-LM8032	8,000×2,500	8,000×3,000×500	3/6/10/15/18	6/10/16/25/30/40	2/3/6/10/13/15T
非标定制式	SCB-LM13032	13,000×2,500	13,000×3,000×500	3/6/10/15/18	6/10/16/25/30/40	2/3/6/10/13/15T
非标定制式	SCB-LM26032	26,000×2,500	26,000×3,000×500	3/6/10/15/18	6/10/16/25/30/40	2/3/6/10/13/15T

台式搅拌摩擦焊接设备 Table-Style FSW Machine



台式搅拌摩擦焊接设备是基于世佳博“精密搅拌摩擦焊机床”理念研发的高端焊接机型。可实现任意平面二维曲线搅拌摩擦焊接功能。机床配备2T/3T/6T焊接机头，可实现铝合金单面6/8/10/12mm的搅拌摩擦焊接。可实现驱动器壳体等水冷结构件产品最快焊接速度1,200mm/min。

T-Style FSW Machine is an advanced one designed on the idea of Sooncable making precise FSW Machine. The machine is equipped with 2/3/6 Ton welding main axle and possesses the capacity of maximum welding thickness of Al-alloy for one side within 6/8/10/12 mm.

台式设备细节展示



设备正面



主轴 4,000 移动速度 10,000



预留液压站空间



设备内部展示



设备背面展示



集中润滑系统



恒压力控制系统



高精度工作台

1—设备总体结构

创新性使用 T 型结构，X/Y 轴沿工位左右 / 前后运动，设备可以承受更大刚性和载荷；

2—Z轴结构

Z 轴采用硬轨设计，可承受更大顶锻力，确保焊接深度可达 8/10mm；

3—设备床身

采用整体式铸造床身，工作台表面精磨，确保高精度，高可靠性；

4—焊接主轴

定制式台湾进口主轴，4,000RPM，可实现驱动器壳体焊接速度 1.2m/min；

5—控制系统

西门子 828D，主轴电机、伺服电机、操作手轮均为西门子原装，全套 PLC、电气模块；

6—传动部件

丝杠、导轨、联轴器、齿轮均为国际一线品牌，定位精度可达 0.008mm/300mm；

7—电气部分

法国施耐德低压配套件，总控开关、继电器、接触器等元器件，抗电力冲击可达 ±20%；

8—人机功能学

全套工业化设计钣金，安全安静，符合汽车行业 6S 规范，操作便利；

9—效率加倍

工作台尺寸：800×500、1200×600、1800×900mm，可实现双工位焊接，错峰装配，可实现一人操作多台设备；

10—功能扩展

可适时选配精准恒压力、DNC、气冷 / 水雾冷却、机头自适应平衡系统功能。

龙门式搅拌摩擦焊接设备

Gantry-Style FSW Machine



龙门结构搅拌摩擦焊接设备是市场通用性较好的一种稳定、高效的搅拌摩擦焊接设备。工作台为水平布置，其两侧的立柱和连接梁构成龙门架。焊接机头装在横梁上，可沿导轨上下移动。

Gantry-Style FSW machine is a stable and efficient FSW equipment with good market versatility. The worktable is arranged horizontally, and the columns and connecting beams on both sides form the gantry. The welding head is installed on the beam and can move up and down along the guide rail.

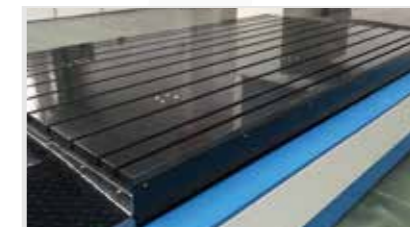
龙门式设备细节展示



设备正面



设备操作界面



高精度工作台



铸造结构底座



设备背部展示



设备底部钣金



恒压力控制系统



横梁立柱整体结构

1—设备总体结构

龙门式结构，工作台移动，X/Y 轴沿工位前后 / 前后运动，立柱保持不动；

2—Z轴结构

Z 轴采用硬轨设计，可承受更大顶锻力，有效减少焊接过程主轴上下跳动；

3—设备床身

采用整体式铸造床身，工作台表面精磨，确保高精度，高可靠性；

4—焊接主轴

定制式台湾进口主轴，4,000RPM，可实现直线焊缝 3,500mm/min；

5—控制系统

西门子 828D/840Dsl，主轴电机、伺服电机、操作手轮均为西门子原装；

6—传动部件

丝杠、导轨、联轴器、齿轮均为国际一线品牌，定位精度可达 0.015mm/1,000mm；

7—电气部分

法国施耐德全套 PLC、开关按钮及电气模块，抗电力冲击可达 $\pm 20\%$ ；

8—人机功能学

全套工业化设计钣金，安全安静，符合汽车行业 6S 规范，操作便利；

9—效率加倍

合理的布局，轻松实现自动化产线集成，设备开放性高，可兼容 AGV；

10—功能扩展

可适时选配精准恒压力、DNC、气冷 / 水雾冷却、机头自适应平衡系统，前导滚轮系统和飞边铣削系统。

定制式搅拌摩擦焊接设备

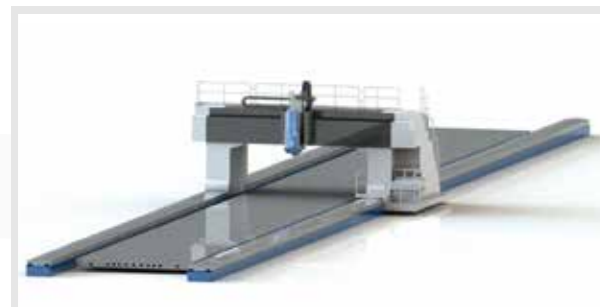
Customized FSW Equipment

设备属性

Device Properties

为适应客户多元化的产品结构需求，世佳博开发多种结构非标搅拌摩擦焊接设备，我们在设备结构、焊接行程、焊接方式、机头载荷以及多维设备结构等方面进行多种焊接设备研发。

In order to meet the diversified requirements of our customers, Sooncable has developed a variety of customized FSW machines.



动龙门搅拌摩擦焊设备

Gantry FSW equipment

动龙门搅拌摩擦焊接设备是特别适合大型零部件产品的一种搅拌摩擦焊接设备结构。两侧跨距很大，设备焊接速度和空运行速度受到很大限制。提高焊接速度和运行速度成为动龙门设备使用的关键。

The moving gantry FSW equipment is very suitable for welding large parts. Improving welding speed and running speed is the key to the use of moving gantry equipment.



双面焊搅拌摩擦焊设备

Double side welding FSW equipment

双面搅拌摩擦焊接设备适用于双层中空结构的产品拼接焊，尤其适用于托盘类产品焊接。设备配套双机头和双横梁，上下两个机头在横梁上同步运行，同步从工件上下表面进行焊接，可大大改善焊接变形并提高焊接效率。

The equipment is equipped with two heads and two beams. The two heads run synchronously on the beam and weld from the upper and lower surfaces of the workpiece.



重载大厚度搅拌摩擦焊设备

Heavy load FSW equipment

重载大厚度搅拌摩擦焊接设备是为高温合金材料、大厚度焊接材料而专门定制设计的一种搅拌摩擦焊接设备。

Heavy load and large thickness FSW equipment is a kind of FSW equipment specially designed for high-melting point and large thickness welding materials.

可回抽龙门搅拌摩擦焊设备

Retractable FSW equipment

可回抽搅拌摩擦焊接设备是适合焊后零件需要消除尾孔的产品结构而设计的一款搅拌摩擦焊接设备。针对筒体环缝尤其适用。

The moving gantry FSW equipment is very suitable for welding large parts. Improving welding speed and running speed is the key to the use of moving gantry equipment.



牵引式搅拌摩擦焊设备

Traction FSW equipment

牵引式搅拌摩擦焊接设备对于长直焊缝产品非常实用，如船舶带筋板、列车壁板等产品。

The retractable Friction Stir Welding equipment is a kind of FSW equipment which is suitable for the product structure of the parts after welding which need to eliminate the tail hole. It is especially suitable for cylinder circumferential seam.



搅拌摩擦焊产品

FSW Products



作为中国知名的搅拌摩擦焊“整体解决方案”提供商，北京世佳博科技集团有限公司（以下简称世佳博）为客户提供灵活的搅拌摩擦焊就近服务。公司在河北固安（距北京大兴国际机场9公里）、在江苏昆山（距昆山高铁南站13公里）、在重庆北碚（距重庆江北机场28公里）、广东东莞企石（距东莞高铁站26公里）建立专业化的生产车间，可以提供搅拌摩擦焊工序加工、搅拌摩擦焊产品打样、搅拌摩擦焊产品开发及搅拌摩擦焊产品OEM等服务。

As a well-known supplier in Friction Stir Welding filed of China, Beijing Sooncable Technology Group Co., Ltd. (hereinafter referred to as Sooncable) provides flexible & nearby FSW service for customers. We have established specialized production workshops in Gu'an, Hebei Province (9 km away from Beijing Daxing International Airport) and Kunshan (13 kilometers away from Kunshan High Speed Railway South Station) in Jiangsu Province, which can provide customers with FSW equipment manufacturing and sales, FSW product processing and OEM manufacturing, FSW tool development and sales, FSW technology development and technical training, etc.

公司拥有世佳博品牌，包含常规、高速、重载荷搅拌摩擦焊设备38台；拥有高精度数控加工设备69台（哈斯、德玛吉等）；拥有数控加工设备、车床、铣床、钻床、磨床等各类设备116台。作为最早成立的三大核心事业部之一（设备发展事业部、产品发展事业部、技术发展事业部），产品发展事业部融合了包括搅拌摩擦焊领域、散热技术领域、金属材料加工领域、铝合金材料铸造成型等领域专家和经验丰富的技术人员以及技能工人。

We have 38 sets of conventional, high-speed, heavy load Friction Stir Welding equipment; 69 sets of high-precision CNC processing equipment (Haas, DMG, etc.); and 116 sets of CNC processing equipment, lathes, milling machines, drilling machines, grinders and other equipment. As one of the first three core business divisions (Equipment Development Division, Product Development Division and Technology Development Division), the Product Development Division integrates experts who are experienced technicians and skilled workers in the fields of FSW, heat dissipation technology, metal material processing, Al-alloy die-casting and molding.



世佳博搅拌摩擦焊设备



世佳博加工中心车间



昆山工厂搅拌摩擦焊设备



东莞工厂搅拌摩擦焊设备

固安工厂 Gu'an Factorie

北区研发制造基地 North District Integrated Service Centre

序号	设备型号	工作台 (mm)	焊接形式	装配主轴
1	SCB-TS850	800×500	一维 / 二维	2/3T
2	SCB-HL850	800×500	一维 / 二维	3/6T
3	SCB-TS1260	1,200×600	一维 / 二维	2/3T
4	SCB-TS1890	1,800×900	一维 / 二维	2/3/4T
5	SCB-LM980	900×800	一维 / 二维	3/6T
6	SCB-LM1512	1,500×1000	一维 / 二维	2/3/6T
7	SCB-LM2520	2,500×1,600	一维 / 二维	2/3/6/10/13T
8	SCB-LM3022	3,000×2,000	一维 / 二维	2/3/6/10/13T
9	SCB-LM4027	4,000×2,500	一维 / 二维	2/3/6/10/13/15T

公司在河北固安（距离北京大兴机场9公里）建立北区设备制造基地。该基地占地面积约12,000平米，是集研发、制造、销售于一体的一站式服务中心。固安已建立门类齐全的检测条件和检测设备。可以实施材料成分分析、力学性能分析、产品尺寸检测、产品性能检测等。

Sooncable has the North district equipment manufacturing base in Hebei . Is a research and development, manufacturing, sales in one-stop service center.Gu'an county has established a wide range of testing conditions and testing equipment.

昆山工厂 Kun shan Factorie

辐射长三角区域 Yangtze River Delta Region

公司在江苏省昆山市陆家镇建立工厂，占地面积超2,600平米。可实现样机展示、产品开发、批量产品工序加工，设备售后服务等功能，能够满足长三角地区客户售前参观、样品制造及售后服务。

Sooncable has built a branch company in Lujia Town, Kunshan City to serve customers in the south of China.

序号	设备型号	工作台 (mm)	焊接形式	装配主轴
1	SCB-TS850	800×500	一维 / 二维	2/3T
2	SCB-HL850	800×500	一维 / 二维	3/6T
3	SCB-TS1260	1,200×600	一维 / 二维	2/3T
4	SCB-LM980	900×800	一维 / 二维	3/6T
5	SCB-LM1512	1,500×1000	一维 / 二维	2/3/6T
6	SCB-LM2520	2,500×1,600	一维 / 二维	2/3/6/10/13T
7	SCB-LM3022	3,000×2,000	一维 / 二维	2/3/6/10/13T

重庆工厂 Kun shan Factorie

辐射西南地区 Radiation Southwest region

序号	设备型号	工作台 (mm)	焊接形式	装配主轴
1	SCB-TS850	800×500	一维 / 二维	2/3T
2	SCB-HL850	800×500	一维 / 二维	3/6T
3	SCB-TS1260	1,200×600	一维 / 二维	2/3T
4	SCB-LM980	900×800	一维 / 二维	3/6T
5	SCB-LM1512	1,500×1000	一维 / 二维	2/3/6T
6	SCB-LM2520	2,500×1,600	一维 / 二维	2/3/6/10/13T

公司在重庆北碚区建立工厂，占地面积超2,000平米。可实现样机展示、产品开发、批量产品工序加工，设备售后服务等功能，能够满足西南地区客户售前参观、样品制造及售后服务。

Sooncable has built a branch company in Beibei, Chongqing to serve customers in the southwest of China.

东莞工厂

Dong guan Factorie

辐射珠三角区域 Pearl River Delta Region

公司在东莞松山湖东部工业园建立工厂，占地面积超2,600平米。可实现样机展示、产品开发、批量产品工序加工，设备售后服务等功能，能够满足珠三角地区客户售前参观、样品制造及售后服务。

Sooncable established a branch in Dongguan, Guangdong Province for FSW processing and after-sales support.

序号	设备型号	工作台 (mm)	焊接形式	装配主轴
1	SCB-TS850	800×500	一维 / 二维	2/3T
2	SCB-HL850	800×500	一维 / 二维	3/6T
3	SCB-TS1260	1,200×600	一维 / 二维	2/3T
4	SCB-LM980	900×800	一维 / 二维	3/6T
5	SCB-LM1512	1,500×1,000	一维 / 二维	2/3/6T
6	SCB-LM2520	2,500×1,600	一维 / 二维	2/3/6/10/13T
7	SCB-LM3020	3,000×1,800	一维 / 二维	2/3/6/10/13T

搅拌摩擦焊接工具

Friction Stir Welding

搅拌头

Tools

搅拌摩擦焊接过程中，一个带有凸起的搅拌摩擦焊接工具（搅拌头）在待焊工件之间进行挤压、摩擦、混合、扩散。搅拌头是搅拌摩擦焊接过程中的主要消耗品，是实现搅拌摩擦焊的重要环节之一，被誉为搅拌摩擦焊的“心脏”。

As the main consumable in the process of friction stir welding (FSW), FSW tool is one of the important links to realize friction stir welding, which is known as the "core" of FSW.



公司组建了以搅拌摩擦焊接专家、博士为核心的搅拌头设计团队、精选国外纯进口搅拌头原材料、采用高精度生产加工设备、严格管控热处理流程、搅拌头表面涂层、产品包装及产品出厂检验等流程，确保搅拌头产品性能优异。

We company has set up a FSW tool design team with FSW experts and doctors as the core, select foreign pure imported raw materials, adopt high-precision production and processing equipment, strictly control the heat treatment process, surface coating, product packaging and product delivery inspection, so as to ensure the excellent performance of FSW tool products.

标准化搅拌头

Standard Tools

经过对搅拌头原材料、热处理工艺、热处理工序的比对选型，北京世佳博科技集团有限公司已标准化几百种搅拌头，适用于焊接全系列铝合金、镁合金、铜合金，以及部分牌号的高温合金钢及钛合金材料。

Through the comparison and selection of raw materials, heat treatment process and heat treatment procedure of FSW tools, Beijing Sooncable Technology Group Co., Ltd. has standardized hundreds of FSW tools, which are suitable for welding all series of Al-alloy, Mg-alloy, Cu-alloy, and some brands of high temperature Stell-alloy and Ti-alloy.

焊缝形式包括平板直缝、平面二维、筒体环缝、筒体纵缝、空间曲面焊缝、相贯线等焊缝；焊接形式包括对接、搭接、对搭接、不等厚焊接、双面焊接、角焊接等多种焊接形式。

The welding forms include flat straight seam, plane two-dimensional, cylinder circumferential seam, cylinder longitudinal seam, space curved surface weld, intersection line, etc. Welding forms include butt joint, lap joint, butt lap joint, unequal thickness welding, double-sided welding, fillet welding, etc.

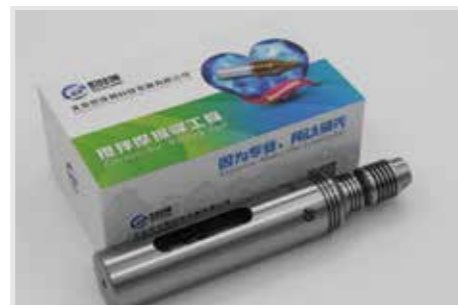


定制式搅拌头

Customed Tools

为进一步满足客户要求，我公司还提供搅拌头OEM制造服务。在常规搅拌摩擦焊接技术的基础上，公司积极探索搅拌摩擦焊接技术的发展，先后开发并成功研制了双轴肩搅拌摩擦焊接搅拌头、静轴肩搅拌摩擦焊接搅拌头、可回抽搅拌摩擦焊接搅拌头。

On the basis of conventional FSW technology, Sooncable actively explores the development of FSW technology, and has successively developed Bobbin FSW tools, Static Shoulder FSW tools.



双轴肩搅拌头



回抽搅拌头

搅拌头工艺配套服务

Technology Solution



为实现高效、稳定及低成本的搅拌摩擦焊接工程领域的广泛应用，除需要专用的搅拌头与搅拌摩擦焊接装备外，还需要与之匹配的搅拌摩擦焊接工装夹具及搅拌摩擦焊接工艺规程。公司提供“专用搅拌头+匹配工艺参数”的定制式服务。该服务体系将包括：专门开发的高性能搅拌头、高效率的搅拌摩擦焊接工装夹具、科学的搅拌摩擦焊接工艺规程，可为您节省开发成本并缩短产品开发过程。

Sooncable provides customization services (customized FSW tools plus welding standard operation procedure) for our industrial enterprises customers who own the Friction Stir Welding equipment. Such service ordinary include: high-performance tool, high efficient FSW tooling jigs, standard operation procedure of Friction Stir Welding. So, we can greatly save developing costs and shorten the product developing process course.

搅拌头保养液

FSW Tool Repairing Liquid

搅拌头使用一段时间后，轴肩部分会沾附一定厚度铝屑，可能造成焊接过程母材混合不均匀，焊缝性能下降等现象。为改善以上情况，世佳博独立开发搅拌头保养液，可有效清除表面附着，恢复外觀光洁度，从而提高搅拌头寿命及焊接稳定性。

After FSW tools are used for a period of time, the shaft shoulder part will be stained with some AL-alloy chips, which may cause the uneven mixing of the base material during the welding process and the decrease of the welding performance. In order to improve the above situation, Sooncable independently developed the FSW Tool Repairing Liquid, which can effectively remove the surface adhesion and restore the appearance smoothness, thereby improving the life of the FSW tools and welding stability.



急速气冷系统

Rapid Air Cooling System

急速气冷系统是根据搅拌摩擦焊技术特点研制开发，用于焊接过程中对工件及搅拌头急速冷却的装置。可产生比压缩空气低 40°C 的洁净低温气流，集冷却、吹屑、清洁于一身，可在一定程度上延长刀具使用寿命，减少工件热变形。

Rapid air cooling system is developed by sooncable according to the characteristics of FSW technology, which is used for rapid cooling of workpiece and FSW tool during welding.

技术服务

Solutions

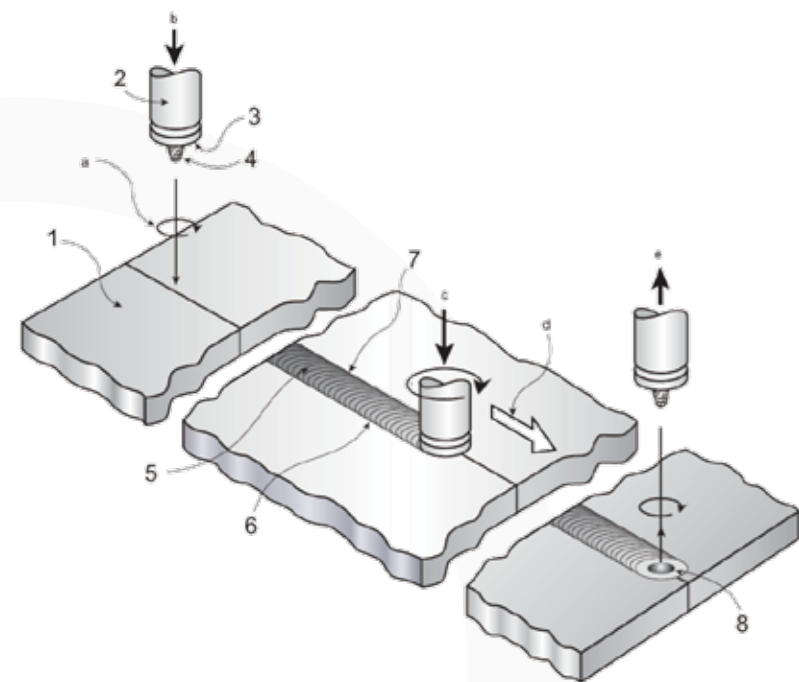
搅拌摩擦焊原理

Principle Of FSW

搅拌摩擦焊是一种纯机械化连续的固相连接方法。搅拌摩擦焊过程中，一个柱形带特殊轴肩和针凸的搅拌摩擦焊工具（搅拌头）旋转着缓慢插入被焊工件的待焊接处，搅拌头和被焊材料之间的摩擦剪切阻力产生了摩擦热，使材料软化发生塑性变形，并释放出塑性变形能，当搅拌头受到驱动沿着待焊界面向前移动时，热塑化的材料由搅拌头的前部向后部转移，并且在搅拌头轴肩的锻造作用下，实现工件之间的固相连接。

Friction stir welding (FSW) is a pure mechanical continuous solid phase bonding method. In the process of FSW, a cylindrical FSW tool with special shoulder and pin convex rotates and slowly inserts into the welding position of the workpieces.

When the FSW tool is driven, it moves forward along the interface. The thermoplastic material is transferred from the front to the rear, and the solid phase connection between the workpieces is realized under the forging action of the shoulder of the FSW tool (shown in the left figure).



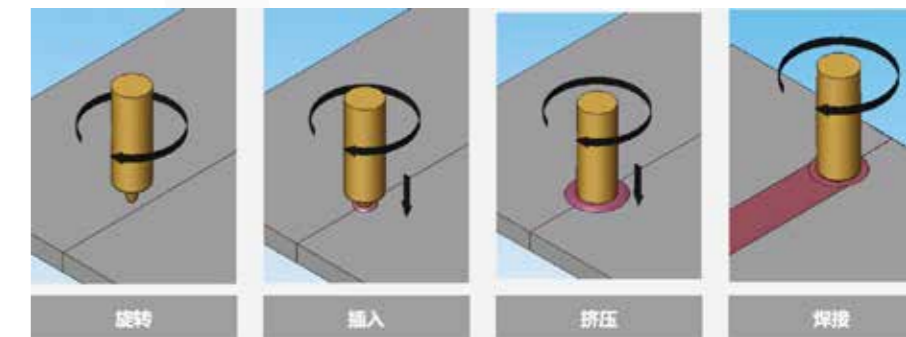
- 1.母材
- 2.搅拌头
- 3.轴肩
- 4.搅拌针
- 5.焊缝表面
- 6.后退侧
- 7.前进侧
- 8.尾孔
- a.搅拌头旋转方向
- b.搅拌头向下移动
- c.轴向压力
- d.焊接方向
- e.搅拌头向上移动

搅拌摩擦焊过程

Four Courses Of FSW

搅拌摩擦焊接过程依次需要历经四大过程，分别是旋转、插入、挤压、焊接。有别于传统的焊接方法，搅拌摩擦焊接过程是一个冷加工过程，焊接后获得的是锻造组织结构的接头。因此，搅拌摩擦焊被认为是焊接史上的重大突破，将为有色金属的连接工艺起到积极的推动作用。

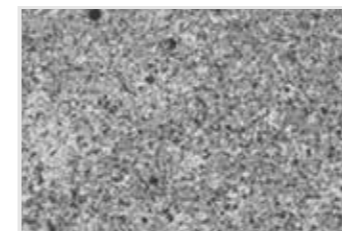
Friction Stir Welding process needs to go through four major processes in turn, namely rotation, insertion, extrusion and welding. Different from the traditional welding method, FSW process is a cold working process. After welding, the joint with forging structure is obtained. Therefore, FSW is considered as a major breakthrough in the history of welding, which will play a positive role in promoting the joining process of non-ferrous metals.



交叉性复合学科

Interdisciplinary

搅拌摩擦焊自1991年发明以来，已在多个领域得到了工业化普及。该技术在发明了近30年后，已逐步成为一门科学的体系，融合了金属材料成型及加工工艺、机床制造及装配工艺、焊接机理及过程控制工艺等几大类的学科。



材料成型及加工工艺



机床制造及装配工艺



焊接机理及过程控制工艺

Since its invention in 1991, Friction Stir Welding has been widely used in many fields. After nearly 30 years of invention, the technology has gradually become a scientific system, which integrates several disciplines such as metal forming & machine processing technology, machine manufacturing & machine assembly technology, welding mechanism & welding course control technology and so on.

技术服务体系

Our technical service

搅拌摩擦焊技术优势

Advantage of FSW



适应强

Adaptability

同种金属材料—不同牌号
异种金属—不同牌号等材料



焊接性能好

Performance

焊接强度非常高
焊接接头延展性能优异



焊接变形小

Deformation

焊接变形仅传统方法的1/6
控制焊接参数可以控制变形



产品一致性高

Uniformity

过程无需人为控制
可以实现高度自动化



经济性优异

Cost-effective

无需打破口—填料—保护气
搅拌头是焊接过程主要耗材



绿色环保

Environment

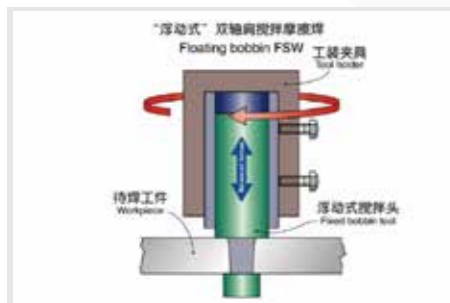
对环境没有特殊要求
焊接过程没有弧光—飞溅—辐射

FSW共性技术开发

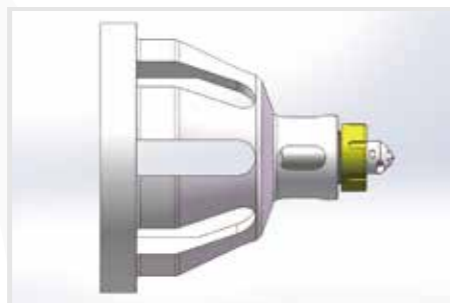
FSW Technology Develop

多样性的搅拌摩擦焊接技术,共同促进搅拌摩擦焊接技术的工程化应用。

Providing variety of FSW technology, jointly promote its engineering application .



双轴肩搅拌摩擦焊接技术



静轴肩搅拌摩擦焊接技术



可回抽搅拌摩擦焊接技术



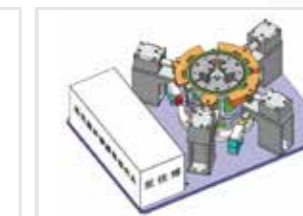
搅拌摩擦焊点焊技术

产品应用技术开发

FSW Engineer Developing

深入了解材料成型及加工工艺,辅以合适的工艺参数及焊接夹具,获得优异体验。
Obtaining excellent results for appropriate process parameters and fixture.

- ▶ 产品制造工艺分析
Analysis of product manufacturing
- ▶ 专用夹具设计制造
Design and manufacture of fixture
- ▶ 异种材料搅拌摩擦焊接
FSW between dissimilar materials
- ▶ 复杂结构搅拌摩擦焊接
Complex structure by FSW



FSW售后技术服务

FSW After-sales service

世佳博拥有以博士为核心的售后技术团队,提供包括焊接机理、设备操作、工艺服务、产线构建等服务。
Our services including mechanism, equipment operation, line construction, etc.

- ▶ 搅拌摩擦焊接机理培训
Training service of FSW mechanism
- ▶ 搅拌摩擦焊接设备操作培训
Training service of FSW operation
- ▶ 搅拌摩擦焊接设备维护保养服务
Training service of FSW maintenance
- ▶ 产品工艺技术开发服务
Training service of FSW development
- ▶ 产品产线构建—升级服务
Upgrading service —product line construction



全面解决产品生产痛点 Solve the pain point of production

痛点一 Pain point one

在常规焊接过程中，焊接材料会存在三种干扰因素：平面度、错边量及对接间隙。由于搅拌摩擦焊对焊接位置的对接间隙及错边量有一定的要求，因此，在未对焊接过程施加任何干预情况下，焊接后容易出现：较大的焊接飞边，同时可能造成更大的焊接变形、甚至出现焊接缺陷。

In the conventional welding process, there are three phenomena of welding materials, misalignment and butt gap. Due to the requirement of friction stir welding clearance and misalignment in the welding position, it is easy to have large welding flash after welding, which may result in larger welding deformation, or welding defect.



是否采用恒压力控制的产品焊接外观图（左侧未采用）

解决方案 Solutions

恒压力控制系统

Pressure control

世佳博设备选用高精度、高灵敏性压力检测单元，具有柔性焊接控制功能，可以实现动态恒压力控制。

With high precision and high sensitivity pressure detection unit and flexible welding control function, it can realize dynamic constant pressure control.



典型恒压力控制系统下产品焊接外观



恒压力控制功能下焊缝外观

- ▶ 优点一：可实现最大错边量为 1mm，平面度 5.0mm/500mm，最大对接间隙为 0.6mm 以内零件失效模式下所带来的对接过程影响；
- ▶ 优点二：可以实现产品的高度一致性，焊缝美观且产品质量稳定可靠；
- ▶ 优点三：搅拌摩擦焊接设备向通用机床迈出坚实一步：解放焊接工人，不再完全依赖操作工人技能，可实现一键启动且实现一人操作多台设备。

痛点二 Pain point two

搅拌摩擦焊接过程中，由于搅拌头的旋转、挤压作用，焊缝中的塑性材料会溢出焊缝区外形成“飞边”，导致焊缝区略薄于母材，不利于焊缝表面质量和接头性能，增加后期成品的打磨工作量。

During the friction stir welding process, the plastic material in the weld overflows the weld zone to form “Flash” due to the rotation and extrusion of the stirring head, resulting in the weld zone being slightly thinner than the base metal, it is disadvantageous to the weld surface quality and joint performance, and increases the grinding workload of the finished product.



未采用静轴肩搅拌摩擦焊接外观图

解决方案 Solutions

静轴肩搅拌摩擦焊接技术

Static Shoulder FSW technology

世佳博在普通搅拌摩擦焊 (FSW) 的基础上研发的静轴肩搅拌摩擦焊接技术 (SSFSW)，在焊接过程中轴肩不旋转，主要热量产生于搅拌针与被焊件的摩擦。因此，热输入大大降低，并且更为均匀，SSFSW 的发展很大程度促进了铝、镁、铜轻金属及其合金的应用。

SSFSW has greatly promoted the application of aluminum, magnesium, copper light metals and their alloys.



静轴肩搅拌摩擦焊接过程



静轴肩铝薄板产品焊接外观

- ▶ 与常规 FSW 工艺相比，静轴肩搅拌摩擦焊在降低焊接载荷的同时，能够减小、甚至消除飞边和孔洞缺陷，减少打磨工作量；
- ▶ 高转速静轴肩搅拌摩擦焊过程中，固定轴肩的使用可以显著地改善表面成形，焊缝外观更平整光滑；
- ▶ 低转速静轴肩搅拌摩擦焊可获得沿板厚方向更均匀的焊缝组织，对于低速薄板焊接，有一定的优势；
- ▶ 静轴肩搅拌摩擦焊表面减薄量小，焊接过程压力较小，焊缝强度更高；

痛点三 Pain point three

鉴于搅拌摩擦焊接机理,在焊接的最后收尾处,会存在焊接工艺孔,我们称之为焊接尾孔,焊接尾孔的存在影响产品结构、美观。特殊结构的焊接产品如果没有很好处理焊接尾孔,则易造成焊接泄露,且需要很大成本消除焊接尾孔。

The existence of the welding tailhole may affect the product structure and aesthetics and it is easy to cause welding leakage.

解决方案 Solutions

机头自适应平衡系统

Adaptive system

基于搅拌摩擦焊接机理及大量客户生产制造中存在的痛点事项,世佳博科技集团率先开发出机头自适应平衡系统功能,可以实现 6mm 以内(含 6mm)焊接工艺孔的高效消除。常规结构,单个尾孔消除时间约 30 ~ 45 秒。

Sooncable firstly created Self-adaptive Balance System, which can realize the high-efficiency elimination of welding process hole within 6mm (including 6mm) . Conventionally, eliminating a single tail hole may need about 30-45 seconds.

- ▶ 用于消除焊接尾孔,无需增加引入引出,大大降低制造成本
- ▶ 用于修复点状缺陷,无需整段焊缝全部重走一遍程序,只需哪里泄露补哪里,方便快捷
- ▶ 用于孤岛结构产品焊接尾孔消除,保证产品合格率
- ▶ 用于产品焊后 CNC 加工过程打孔错误位置的修复



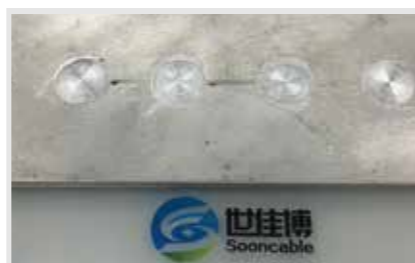
消除焊接尾孔,减少制造成本



孤岛结构水冷板产品



修复点状缺陷



修复 CNC 打孔偏差

痛点四 Pain point four

铜铝异种合金连接具有降低成本和结构件减重的作用,广泛应用于航空航天、轨道交通、汽车等领域,尤其在新能源汽车领域具有较大的应用潜力。但铝合金和铜合金之间存在很大的化学、物理及力学性能差异,硬度和流动性差异比较大,很难实现连接。

Copper-aluminum dissimilar alloy joint can reduce cost and reduce weight of structure. It is widely used in aerospace, rail transit and automobile, especially in new energy vehicle. However, there are great differences in chemical, physical and mechanical properties between aluminum alloy and copper alloy, which lead to great differences in hardness and fluidity.

解决方案 Solutions

铜铝异种合金搅拌摩擦焊

Static Shoulder FSW technology

世佳博从工艺参数的优化、搅拌头结构设计和外部环境冷却等多个方面进行了反复的试验和优化,突破了铜铝异种合金对接和搭接搅拌摩擦焊接技术难题,成功实现了 2-5mm 铜铝异种合金搅拌摩擦焊接。

After repeated experiments and optimization in process parameter optimization, stirrer structure design and external environment cooling, the friction stir welding joint of 2-5mm cu-al dissimilar alloy was successfully realized.



铜铝搭接搅拌摩擦焊



铜铝极柱



铜铝软连接

- ▶ 焊缝表面成型美观,接头内部无缺陷;
- ▶ 接头强度可以达到母材强度的 70%,折弯效果、扭矩、拉拔力和导电性均可以满足性能要求;
- ▶ 该技术已成功应用于特斯拉汽车、比亚迪汽车铜铝端子,铜铝导电排等类似产品的批量焊接。

痛点五 Pain point five

搅拌摩擦焊作为固相连接技术，已成为有色金属材料焊接的首选工艺，可以有效避免材料在焊接过程中的烧穿和焊缝成型不良等问题。但在焊接过程中，焊接变形问题依然十分严重，是在生产过程中急需解决的一大难题。

Sooncable created The Welding Orthopaedic System on 6T load or above FSW equipment, which can be used for straightening cold-plate production and getting good results.

解决方案 Solutions

焊接矫形系统

Welding orthopaedic system

基于搅拌摩擦焊接机理及大量客户生产制造中存在的焊接变形问题，世佳博科技集团在 6T 载核及以上设备，可选装焊接矫形系统，可将 1 平方米以内，厚度 20mm 冷板，矫形至 1mm 以内（正常情况下该产品焊后变形超过 3 ~ 10mm），并提供完整焊接工艺规程。

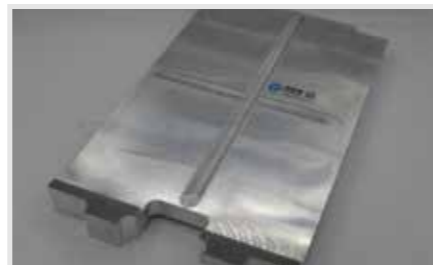
During the FSW process, the problem of welding deformation is still very serious, which is a major problem that needs to be solved urgently in the production process.



产品焊接正面



产品焊接后采用变形控制效果



产品焊接矫形

痛点六 Pain point six

在焊接过程中，生产现场设备运行状态不能实时监控，产品焊接数量手工统计信息不准，产品焊接质量问题无法及时追踪原因，设备基础保养周期监管不到位，且焊接人员随意更改工艺参数等现象。

On-site equipment running status can not be real-time monitoring, product welding quantity is not accurate manual statistical information, product welding quality problems can not be traced in time, equipment basic maintenance cycle supervision is not in place, and welding personnel to change the process parameters at will and other phenomena.

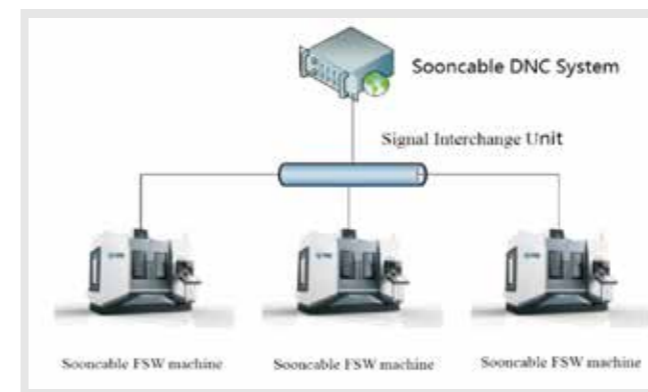
解决方案 Solutions

DNC管理系统

DNC control system

世佳博设备 DNC 管理系统可安装在客户自配的工控电脑上，可实现多台设备的远程数据传输、远程故障诊断、实时生产状态显示、搅拌头管理、产品质量追溯、生产效率统计、设备故障及维护保养功能。

Realize remote data transmission, fault diagnosis, real-time production status display, tool management, quality traceability.



DNC 管理系统

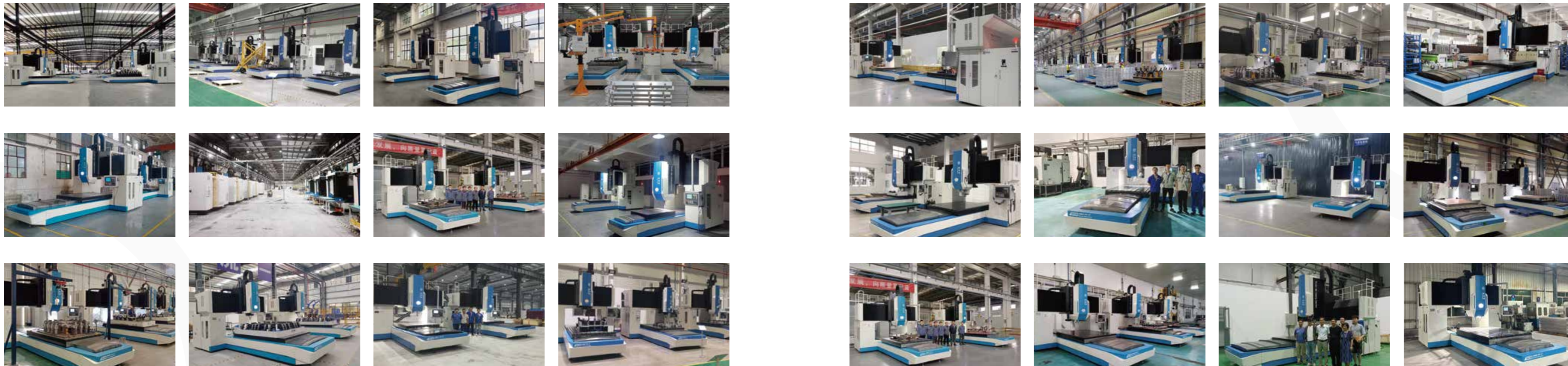
- ▶ 该系统可对搅拌头进行有效的管理，可根据搅拌头的编号查询所焊接的零件编码，同时对搅拌头的使用寿命进行记录和预警；
- ▶ 通过扫描工件上的二维码，系统会自动读取工件编号并进行存储，该工件焊接过程中的重要参数都会自动进行记录，既可实现生产数据统计，又可确保生产质量控制及终端客户对过程数据的全流程监控；
- ▶ 设置状态上下限，确保焊接过程在可控范围内安全生产。例如可设置压力值上下限，如焊接过程因为搅拌头磨损、断裂等情况，焊接压力急剧下降时，可对焊接机床进行停机操作控制；
- ▶ 该系统可实现一些基础的设备维护保养提醒等功能。

台式设备案例

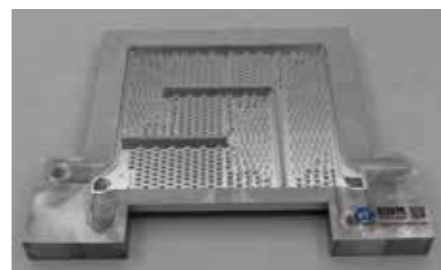
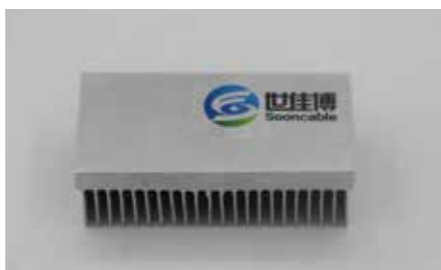
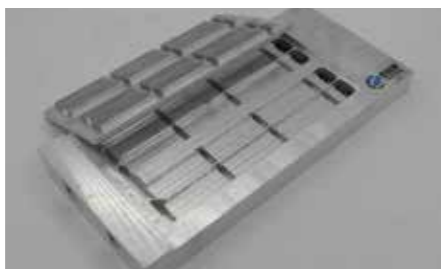
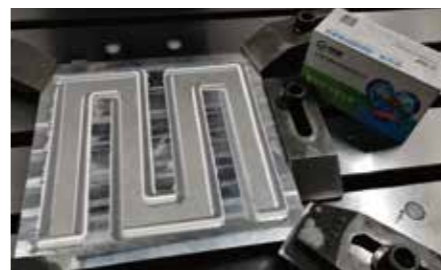
Project Case



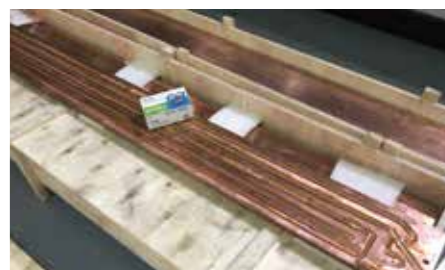
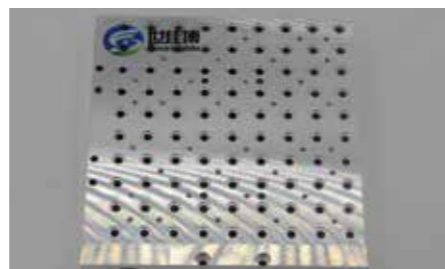
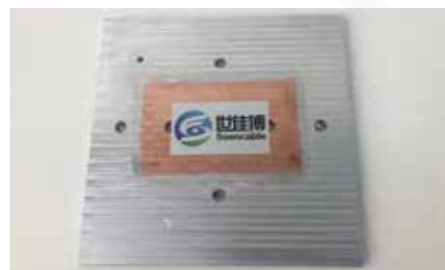
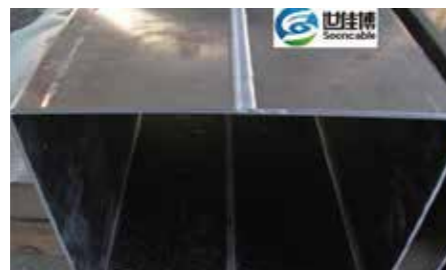
龙门式设备案例 Project Case



产品案例 Products Case



产品案例
Products Case



部分客户

Our Customers



合作畅想

Cooperation

世佳博技术优势

Technical Advantages Of Sooncable

公司在搅拌摩擦焊接领域、散热技术领域、大型机械装备制造领域、金属材料加工、有色金属材料成型等领域拥有丰富经验。将助力我们的合作伙伴在短期内完成工艺突破，切实解决产品制造痛点，实现高速焊接。



丰富的产品与解决方案



广泛的客户成功案例



遍布全国的渠道和就近服务

Sooncable has rich experience in the field of friction stir welding, heat dissipation technology, manufacturing of large machinery and equipment, metal material processing, Non-ferrous metal material forming and other fields.

世佳博合作优势

Cooperation Advantages Of Sooncable

- ▶ 1—专业化的搅拌摩擦焊接服务 Professional friction stir welding service
多年工艺积累及实施经验；焊接整体夹具，具体到节拍；
- ▶ 2—就近的快捷服务 To the nearest service
京津冀、长三角、珠三角；优异的项目执行力；
- ▶ 3—领先的焊接工艺 Leading welding process
恒压力控制、铣焊一体；焊接速度 3,500mm/min。