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三克激光官网



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售后服务

# CATALOG 产品手册

## 上海三克激光科技有限公司

SHANGHAI 3K LASER TECHNOLOGY CO., LTD.

# 公司简介

上海三克激光科技有限公司成立于 2005 年，是激光智能制造行业的高新技术企业。总部及研发中心位于国家级产业园 G60 科创走廊 - 松江漕河泾科技绿洲，并在天津、深圳设有分支机构，主要产品包括：锂电自动化焊接系统、太阳能光伏激光切割系统、高速激光清洗系统、精密激光微加工系统、激光打孔系统、激光打标系统、激光划片及非标自动化设备的定制。

三克激光配套自动化的精密激光焊接系统和激光切割系统，广泛应用于汽车新能源行业、生物医疗、通信行业 5G 技术等，激光微加工系统广泛应用于 PI 膜、FPC、PCB 电路板的切割，激光划片机广泛应用于太阳能叠瓦技术领域、硅片的切割等。

三克激光团队勇于创新，在激光精细加工领域已经取得了多项发明和实用新型专利，自主研发了拉丝模精密激光打孔机、造币模具浮雕机、全息幻彩雕刻机，并在 2017、2018 年国际创新创业大赛上海赛区获奖，广泛应用于造币、纪念币、拉丝模等行业；公司自主研发激光清洗机，实现了环保、无耗材的产品表面清洁方式，广泛应于 3C、半导体、通讯、新能源等行业，结合自动化配置，满足客户智能装备、产业升级的要求；三克激光已通过 ISO9001、ISO14001 质量体系认证，主要产品已通过欧盟 CE 认证，公司产品远销多个国家和地区。同时引进 ERP 和 CRM 信息管理系统，对客户和所售产品均建立详细的管理档案，提供完善的技术服务咨询及系统解决方案。您何时何地购买三克激光的设备及核心器件，我们都能提供防伪和产品追溯查询。

三克激光自成立以来，始终坚持以市场为导向、技术创新为动力、服务客户为宗旨的原则，将产品技术、系统集成方法与生产管理相结合，为客户提供激光智能解决方案，帮助企业实现产品升级换代。我们热诚欢迎您来三克激光沟通交流，我们将为您提供设备应用解决方案。



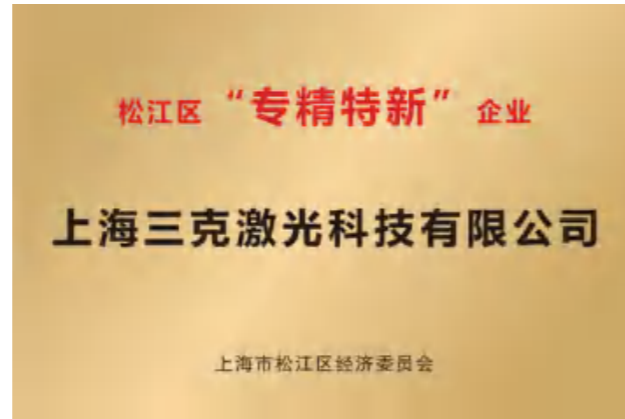
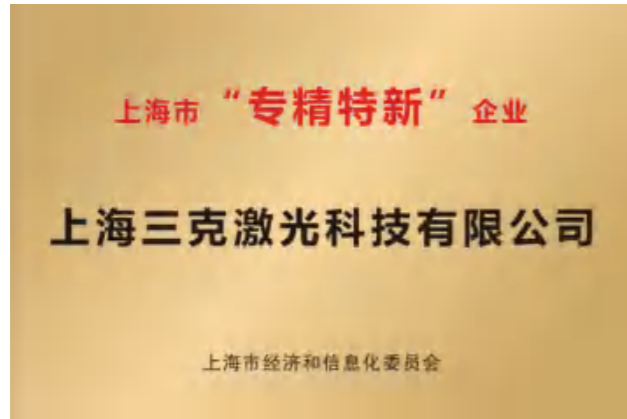
## COMPANY PROFILE

Founded in 2005, Shanghai 3K Laser Technology Co, Ltd. is a high and new technology enterprises . The headquarters and R&D center are located in the national industrial park, constitute the G60 Science and technology Innovation Corridor- Songjiang Caohejing Technology Oasis, and branches in Tianjin and Shenzhen.Our main products include: lithiumion automatic welding, solar photovoltaic laser cutting , high-speed laser cleaning, precision laser microprocessin, laser drilling, laser marking, laser scribing,laser micromachining and nonstandard automation equipment customization.

The precision laser welding system and laser cutting system of 3K Laser supporting automation are widely used in automobile new energy industry, biomedical, communication industry 5G technology, etc. The laser micro-processing system is widely used in the cutting of PI film, FPC, and PCB circuit boards. Laser scribing machines are widely used in the field of solar shingle technology and silicon wafer cutting.

The 3K laser team has innovative spirit.We obtained a number of invention and utility model patents in the field of laser fine processing.We developed the drawing die precision laser drilling , the coin-making mold relief , the holographic magic color engraving independently. We won the awards in the Shanghai Division at International Innovation and Entrepreneurship Competition in 2017, 2018 . Our machines are widely used in coinage, commemorative coins, wire drawing and other industries.Our laser cleaning machine independently developed which achieve environmentally friendly and non-consumable product surface cleaning methods, widely used in 3C, semiconductors , communications, new energy and other industries,combined with automated configuration to meet customer requirements for intelligent equipment and industrial upgrading.

荣誉展示  
CERTIFICATE



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# 激光振镜系统

## LASER WELDING SYSTEM

此2D振镜系统核心器件采用德国SCANLAB原装进口的高功率光学器件及控制部分和三克激光自主研发的软件控制系统及电控部分组成,可适配最高输出功率达8kw的光纤激光器和碟片式激光器,可同时适用于静态焊接、龙门机床和机械手不同应用场景。选用90°或180°的准直模块支持不同的空间设计,90°准直接口可以搭载LWM、Weldcheck WDD等焊中检测设备;定制德国SCANLAB特殊冷却和视觉涂层的振镜和准直模块,可以搭载OCT、LDD实时熔深检测设备。基于德国SCANLAB控制卡自主研发的控制软件可选配开通FLY功能,实现在线飞行功能。

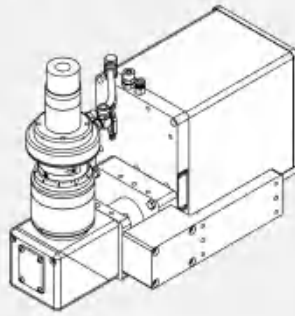
控制软件采用闭环控制系统,时刻监控振镜位置状态;采用高级别的系统安全机制,可10ms内关掉激光;软件可自由编程实现多种摆动功能;配备德国SCANLAB原装双层保护镜片装置、准直前保护镜片和稳定可靠的双层风刀,可有效地防止光学组件上的烟尘和飞溅。配置水冷和气冷双冷却循环系统和欧洲进口的空气过滤器,确保系统长期运行稳定。



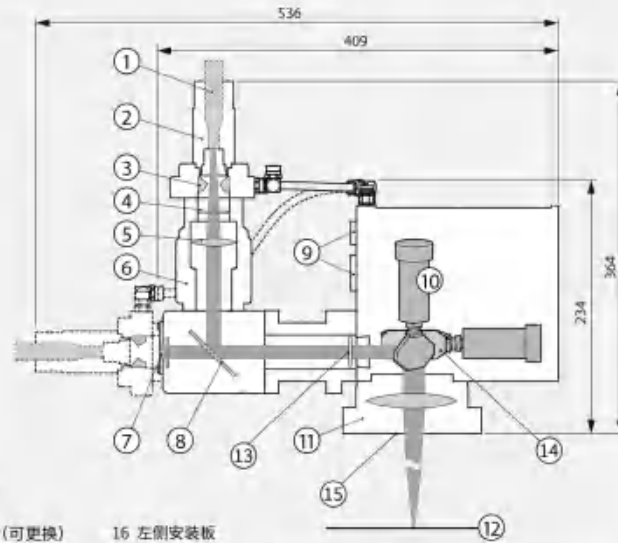
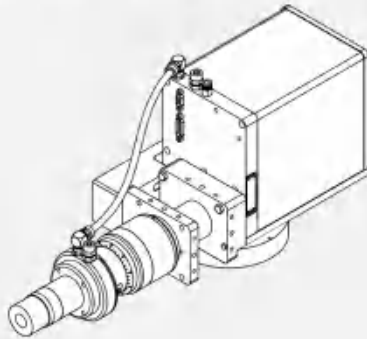
### 3K-SCANNER 技术参数

机械接口(安装方向) Machine interface (mounting side)	左/右(默认),如下图所示
准直模块版本 Collimator version	直(180°)/弯(90°)
重量(无附件) Weight (without attachments)	12.8 kg @直, 14.4 kg @弯
运行温度 Operating temperature	25°C ± 10°C
电源电压 Supply voltage (requirements)	30 V DC (29 - 33 V), respectively max. 8 A
水冷流量 Specification cooling fluid	2 l/min at 20°C and $\Delta p < 0.1$ bar; $p < 4$ bar
洁净气要求 Filter unit purge air specification	ISO 8573-1:2010, class 5.4.4
定位精度 Positioning accuracy	< 0.2 mm
重复性(RMS) Repeatability (RMS)	< 2 $\mu$ rad
超过8小时长时间漂移(运行温度) Long-term drift over 8 h (operating temperature)	< 0.6 mrad intelliSCAN 30 < 0.1mrad (升级 intelliSCAN III30)
相机/过程传感器接口 Camera / process sensor connection	仅可用于带90°准直模块的振镜
准直保护抽屉 Collimator cover slide	标配(可替换)
IP防护等级 IP protection class	IP54
OCT选项设计 Design for OCT option	根据需求可定制预留OCT接口准直和振镜

### intelliSCAN 带 90° 准直(弯)

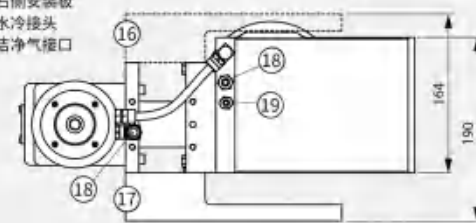


### intelliSCAN 带 180° 准直(直)



#### 图例

- 1 光纤连接器
- 2 光纤适配器
- 3 孔径带水冷
- 4 准直保护镜片(可更换)
- 5 准直镜
- 6 z方向调整圆环
- 7 相机/过程传感器接口
- 8 分光镜
- 9 电源和数据接口
- 10 振镜马达
- 11 场镜
- 12 工作平面
- 13 准直出口保护镜片
- 14 振镜片
- 15 双层保护镜片
- 16 左侧安装板
- 17 右侧安装板
- 18 水冷接头
- 19 洁净气接口



所有尺寸的单位为mm

## 3K-SCANNER 光学技术参数 (\*可用单模激光器)

准直镜聚焦长度	116mm			132mm		
聚焦镜聚焦长度	255 mm*	420 mm	460 mm	255 mm*	420 mm	460 mm
光纤适配器	QBH, QD (LLK-D)					
波长	1055-1085 nm (石英基材), 1055-1085 + 880 nm (+ NIR), 1030-1090 + 880 nm(硅基材)					
NA 限制值(半角) @86%	0.083 rad			0.073 rad		
NA 限制值(半角) @98.x%	0.125 rad			0.110 rad		
光学放大比	1:2.2	1:3.6	1:4	1:1.9	1:3.2	1:3.5
工作范围@ z=0(椭圆) in mm	170 × 105	340 × 175	380 × 290	170 × 105	340 × 175	380 × 290
工作范围@ z=0(矩形) in mm	95 × 95	175 × 175	245 × 245	95 × 95	175 × 175	245 × 245
最大激光功率	1055-1085 nm = 8 kW, 1055-1085 nm + 880 = 8 kW, 1030-1090 + 880 nm = 6 kW					
平均激光功率@ 1 min Duty cycle	1055-1085 nm = 5 kW, 1055-1085 nm + 880 = 4 kW, 1030-1090 + 880 nm = 4 kW (参考下页视觉涂层)					
光纤芯径	≥50 μm (多模激光器)					
第二层保护镜片	✓	✓	✓	✓	✓	✓
烟尘保护模块	✓	✓	✓	✓	✓	✓
工作距离(到握镜壳体下边缘)	397mm	566mm	563mm	397mm	566mm	563mm

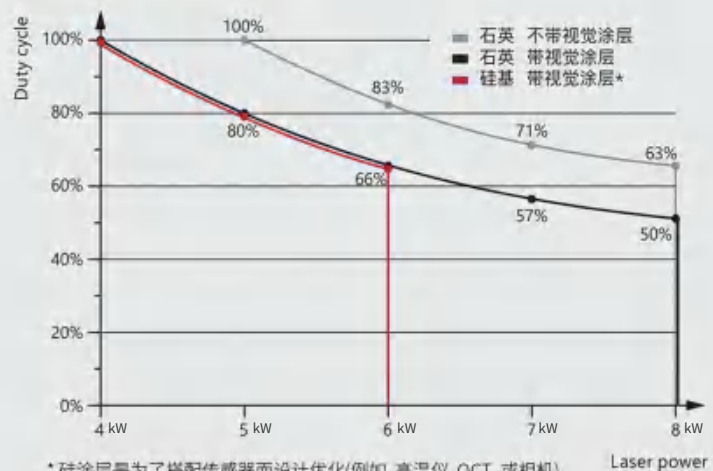
## 3K-SCANNER 动态参数

阶跃响应时间(阶梯调谐)	
1% 全范围响应时间	1.2 ms
10% 全范围响应时间	3.5 ms
100% 全范围响应时间	11 ms
跟踪误差	≤ 0.2 mm
重复定位精度(RMS)	< 2 μrad
8小时以上长期漂移(intelliSCAN 30)	< 0.6 mrad
(升级为intelliSCAN III30)	< 0.1 mrad

## 3K-SCANNER 外供

电压要求	30 V DC (29-33 V), max. 8 A each
输入输出信号	SL2-100 or XY2-100
重量	14-21 kg
工作温度	25°C ± 10°C
水路要求	5 l/min at 20°C and Δp = 0.1 bar, P = 4 bar
气路要求	20 l/min at Δp = 2 bar, ISO 8573.1:2010, class 1.4.1

## 激光使用占比示意图



# 龙门飞行激光焊接机

## GANTRY FLYING WELDING MACHINE



本机采用扫描振镜的方式把激光光束聚焦到工件上, 轻便和高速动态的扫描振镜准确地在焊缝之间跳转, 可以将更多的时间用于焊接和更少的时间来对下一个焊缝进行定位, 为客户提高产量, 减少投入成本 可选配旋转台, 实现多个圆柱电池集流盘飞行焊接。

This machine adopts the galvanometer to focus the laser beam on the workpiece, and the light-weight、high-speed dynamic galvanometer accurately jumps between the weld seams, so that more time can be spent on welding and less time to position the next weld seam, which can increase production and reduce investment costs for customers. Also can choose optional rotary table, to enables flying welding of multiple cylindrical cell collector plate.

- 振镜扫描速度快, 范围大。
- 可选配扩展 X、Y 水平移动电动工作台, 适合在焊接区域超过振镜扫描范围的情况下使用。
- 振镜 Z 轴电动调整, 方便焦点调节。
- 可选配 CCD 视觉系统, 方便观察焊接效果。
- Fast scanning speed, large range
- Optional extended X, Y axis electric moving platform, which is suitable to use in welding areas beyond the scope of galvanometer scanning.
- The galvanometer Z-axis is electrically adjusted for easily adjusting the focus.
- Optional CCD vision system for easy observation of welding results.

应用于新能源电池、医疗器械、航空航天、汽车配件、仪器仪表、3C、IT 电子等产品的高效率激光点焊或密封焊。

It can be applied to high-efficiency laser spot welding or sealing welding in New Energy Vehicles, Medical Devices, Aerospace, Automotive Parts, Instrumentation, 3C, IT Electronics and other products.

适用于精密不锈钢、碳钢薄板、铜箔、铝箔、金、银等多种金属或合金; 也可用于多种异种材料间的焊接。

Suitable for precision stainless steel, carbon steel sheet, copper foil, aluminum foil, gold, silver and other metals or alloys and also can be applied in a variety of dissimilar materials welding.

性能 / 型号	Performance/model	SK-FW 2000	SK-FW 3000	SK-FW 4000	SK-FW 6000
最大激光器功率	Max. laser power	2000W	3000W	4000W	6000W
激光波长	Wavelength	1070±5nm	1070±5nm	1070±5nm	1070±5nm
冷却方式	Cooling	水冷 Water	水冷 Water	水冷 Water	水冷 Water
功率可调性	Power tunability	10-100%	10-100%	10-100%	10-100%
工作模式	Working model	连续 CW	连续 CW	连续 CW	连续 CW
供电电源	Power supply	AC380V/50Hz	AC380V/50Hz	AC380V/50Hz	AC380V/50Hz
机器尺寸(长*宽*高)	Machine size (L*W*H)	1300*1800*2150mm			

# 扁铜线电机激光焊接机

## LASER WELDING MACHINE FOR HAIRPIN

本机采用视觉系统对扁铜线电机的每个PIN 进行精准定位，通过先进的图像识别技术，设备能够迅速而准确地锁定焊接点，协同搭载的高速扫描振镜的快速反应，实现了一次性多点焊接功能，使得焊接过程更为高效和精准，从而保证焊接的准确性和稳定性，为电机制造业提供了可靠的焊接解决方案。

This machine adopts Vision System to accurately position each PIN of the hairpin motor, by the advanced image recognition technology, the equipment can quickly and accurately target the welding point, and cooperate with the high-speed response of the high-speed scanning galvanometer, to achieve multi-point welding at one time function, making the process more efficient and precise, so as to ensure the accuracy and stability of the welding, also have provided reliable welding solution for the motor manufacturing industry.

- 焊前测量、监控 pin 线配合的间隙、左右偏差和角度。
- 对小偏差 pin 线智能调用特殊配方进行焊接。
- 等离子体吹散系统保证稳定的激光有效输入能量。
- 位置补偿功能消除边缘视场焊点偏头现象。
- Measurement and monitoring of gap, left and right deviation and angle of the pin wire matching before welding.
- Intelligent invoke special formula for welding of small deviation pin wire.
- Plasma Blowout System ensures stable laser to effectively input energy.
- Position compensation function can eliminate welding deviation at the edge field of view.

广泛应用于新能源汽车扁线电机行业，适用于扁铜线材质激光扫描焊接。

It is widely used in new energy automobile hairpin motor industry, suitable for hairpin material laser scanning welding.



性能 / 型号	Performance/model	SK-CW6000	SK-CW8000
最大激光功率	Max. laser power	6000W	8000W
激光波长	Wavelength	1030-1090nm	1030-1090nm
光纤适配器	Fiber adapter	QBH, QD/LLK-D,Q5/LLK-B	QBH, QD/LLK-D,Q5/LLK-B
通光孔径	Aperture	Φ30mm	Φ30mm
最大扫描速度	Scanning speed	6000mm/s@f=420	6000mm/s@f=460
扫描精度	Scanning accuracy	≤2μrad	≤2μrad
温度漂移 (连续烤机 8h)	Temperature drift	<30μrad	<30μrad



# 手持式光纤激光焊接机

## HANDHELD FIBER LASER WELDING



本机适合多种不同场合的应用，如广告、家具、温室搭建，在注塑机上的超大型模具、叉车、汽车上进行焊接等。

This machine is suitable for a variety of applications, such as advertising, furniture, greenhouse construction, welding on super-large molds, forklifts, and automobiles.

- 激光焊接头结构轻巧，内置冷水机一体式集成。
- 激光光束质量好，能量分布均匀，焊点大小均匀，深度一致。
- 使用激光功率实时反馈控制系统，性能稳定。
- 操作智能，仅对金属件出光，非金属件不出光。
- 可远距离操作，光纤防折弯支撑防护，便于收纳。
- 可选配送丝系统。
- Compact laser welding head structure, integrated water cooling machine.
- Laser beam high-quality, energy distribution and welding spot size is uniform, consistent welding depth.
- Performance is stable, because of using a laser power real-time feedback control system.
- Intelligent operate, only for metal parts, do not emit light on non-metallic parts
- Optional wire feeding system.

广泛应用于不易用固定光路焊接机实现的大型、复杂工件焊接的行业。

Widely used in the industry of large and complex workpiece welding that is difficult to achieve with a fixed optical path welding machine.

适用于不锈钢、碳钢、普通合金钢、冷作高合金钢、热锻高合金钢、含镍工具钢、高级钢、高韧铝合金、铜合金、铍铜、紫铜和极硬合金材料，以及镍合金、冷锻钢等多种金属及其合金的搭焊、拼焊、叠焊、角焊等。

It is suitable for stainless steel, carbon steel, common alloy steel, cold work high alloy steel, hot forged high alloy steel, nickel-containing tool steel, high-grade steel, high-tough aluminum alloy, copper alloy, beryllium copper, red copper and extremely hard alloy materials, and lap welding, tailor welding, seam welding, fillet welding of various metals and alloys thereof such as nickel alloy and cold forged steel.

性能 / 型号	Performance/model	SK-CW1000	SK-CW1500	SK-CW2000
最大激光功率	Max. laser power	1000W	1500W	2000W
激光波长	Wavelength	1070-1080nm	1070-1080nm	1070-1080nm
冷却方式	Cooling	水冷 Water	水冷 Water	水冷 Water
焊接厚度	Welding thickness	≤2mm	≤2.5mm	≤3mm
不锈钢焊接熔深	SS depth of fusion	1.5mm	2.5mm	3.5mm
碳钢焊接熔深	C.S depth of fusion	1.5mm	2.5mm	3.5mm
镀锌板焊接熔深	SGCC depth of fusion	1.2mm	2.5mm	2.5mm
供电电源	Power supply	AC220V±10% 5KW	AC220V±10% 7KW	AC380V±10% 9KW
机器尺寸(长*宽*高)	Machine size (L*W*H)	1200*600*1650mm	1200*600*1650mm	1200*600*1650mm
机器重量	Machine weight	300Kg	300Kg	300Kg

# 微型激光点焊机

## MINI LASER SPOT WELDING

本机专门针对牙科义齿点焊、医疗器械精密点焊、珠宝首饰点焊、高校研究教学等行业而设计，系统稳定，操作方便，可用于金银首饰、电子元器件补孔、点焊砂眼、焊镶口等。

This machine is specially designed for dental denture spot welding, medical equipment precision spot welding, jewelry spot welding, university research and teaching, etc. The system is stable and easy to operate. It can be used for gold and silver jewelry welding electronic components to fill holes and points. Welding sand holes, welding inserts, etc.

- 自动抽水一键操作。
- 水冷的冷却方式，降低使用和维护成本。
- 显微镜和内置摄像系统，观察方便。
- 体积小巧设计紧凑，节省空间。
- 彩色触摸屏，人机交互界面友好。
- Automatic pumping with one button operation.
- Air cooling reduces heat and maintenance costs.
- Microscope and built-in camera system for easy viewing.
- Small size and compact design save space.
- Color touch screen, friendly interface.



广泛应用于医疗器械点焊、假牙补砂眼、珠宝首饰点焊、钟表游丝、集成电路引线各种微小、热敏感零件的精密焊接，适于医疗器械、牙科义齿、珠宝首饰、高校研究所、电子、通讯等行业。

Widely used in precision welding of medical equipment spot welding, dental denture replenishing, jewelry spot welding, watch hairspring, integrated circuit lead, various tiny, heat sensitive parts, suitable for medical equipment, dental dentures, jewelry, university research institutes, electronics, communications and other industries.

适用于口腔义齿点焊、精密医疗器械点焊、金银首饰激光点焊加工，不锈钢激光焊接，各类激光点焊，以及精细金属零件手工激光焊接。

Applicable to dental denture spot welding, precision medical equipment spot welding, gold and silver jewelry laser spot welding, stainless steel laser welding, various types of laser spot welding, also used for precision fine metal parts.

性能 / 型号	Performance/model	SK-LSW60	SK-LSW80	SK-LSW100
最大激光功率	Max. laser power	60W	80W	100W
激光波长	Wavelength	1064nm		
冷却方式	Cooling	水冷 Water		
激光频率	Laser frequency	1.0-15.0Hz		
脉冲宽度	Pulse Width	0.1~10.0ms 分级可调 Adjustable		
光斑调节范围	Light spot range	0-0.3mm		
主机耗电功率	Power consumption	≤2KW		
操作方式	Operation method	触摸控制 Touch control		
供电电源	Power supply	AC220V±10%/1PH/50Hz		
机器尺寸(长*宽*高)	Machine size (L*W*H)	510*295*395mm		
整机净重	Net weight	28KG		

# 塑料焊接机

## PLASTIC LASER WELDING



	PP	PE	PET	PBT/ASA	PA6	PA66	PC	PS	ABS	ASA	SAN	PMMA
PP	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
POM	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
PE	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
PBT/ASA	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
PA6	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
PA66	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
PC	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
PS	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
ABS	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
ASA	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
SAN	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
PMMA	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
其他	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green

本机主要由专用激光焊接头，四轴运动控制软件，三轴机器人模组组成；采用全封闭防激光辐射一体化设计；具备连续轨迹示教和远程控制功能，可附加同轴温度控制系统，可靠识别焊线中的异常和焊接温度。

This machine is mainly composed of a dedicated laser welding head, four-axis motion control software, and a three-axis robot module; it adopts a fully enclosed laser radiation protection integrated design; it has continuous trajectory teaching and remote control functions, and can be added with coaxial temperature control. The system reliably identifies any abnormalities in the welding line and welding temperature.

- 焊接区域焊缝浅，外观精美；
- 可焊接外形复杂的产品，适用于 3D 零件焊接；
- 可通过 CCD 视觉系统和温度探头进行在线监控；
- 焊接过程无树脂降解，焊接后可直接使用，无需清洗。
- Shallow welding area and exquisite appearance;
- Suitable for welding complex products and 3D parts;
- Online monitoring can be carried out through CCD vision system and temperature probe;
- No resin degradation during welding, and it can be used directly after welding without cleaning.

广泛应用于医疗器械、塑料外壳、汽车塑料零部件、太阳能板、照明产品、进气歧管或液体容器等工件。

Widely used in medical equipment, plastic casings, automotive plastic parts, solar panels, lighting products, intake manifolds or liquid containers and other workpieces.

适用于 ABS、PP、PE、PA、PC、PS、PVC、PBT、POM、PET、PMMA 等热塑性材料及各种改性的工程塑料。

It is suitable for ABS, PP, PE, PA, PC, PS, PVC, PBT, POM, PET, PMMA and other thermoplastic materials and various modified engineering plastics.

性能 / 型号	Performance/model	SK-PLW50	SK-PLW100	SK-PLW200	SK-PLW400
最大激光功率	Max. laser power	50W	100W	200W	400W
激光波长	Wavelength	800-1000nm			
冷却方式	Cooling	风冷 Air		水冷 Water	
定位精度	Positioning accuracy	X/Y/Z 轴: ≤0.05mm; U 轴: ≤0.10			
运动速度	Movement speed	X/Y/Z 轴: 100mm/s; U 轴: 100rpm			
焊接线宽	Welding line width	0.5-3.0mm			
供电电源	Power supply	AC220V±10%/1PH/50Hz			
机器尺寸(长*宽*高)	Machine size (L*W*H)	1250*700*1700mm			
机器重量	Machine weight	250Kg			

- 未绷紧的薄钢片切割
- 已绷紧的模板切割
- 其它种类的薄金属片切割
- 功率均衡控制 (选项): 具有独特的功率均匀模糊逻辑控制方法, 提升切割质量。
- 在线检测功能 (选项): 具备在线检测和测量功能。
- 支持自动上料 (选项): 对较长网版, 自动进料、对位。
- Cutting of thin steel sheet without stretching the net
- Template cutting of stretched net
- Other kinds of thin metal sheet cutting
- Power balance control (optional): It has a unique power uniform fuzzy logic control method to improve cutting quality.
- Online detection function (optional): with online detection and measurement functions.
- Support automatic feeding (optional): for longer screens, automatic feeding and registration.



本机采用高精度、高刚性特种导轨, 高加速度的直线电机, 高精度编码器位置反馈, 解决传统的伺服电机加滚珠丝杆结构存在的刚性不足、空回及死区等问题, 速度更快、精确度更高。加工过程自动对焦, 无需焦距调整。具有自主知识产权的软件系统智能激光微加工应用平台, 是在 PowerCAM 基础上发展的激光微加工平台, 功能强大, 操作简捷, 兼容各种设计文件格式。

This machine adopts high-precision, high-rigidity special guide rail, high-acceleration linear motor, high-precision encoder position feedback, and solves the problems of insufficient rigidity, empty return and dead zone in the traditional servo motor plus ball screw structure, and the speed is faster, higher accuracy. Auto focus during processing, no need to adjust focus. The software system with independent intellectual property rights, is a laser micromachining platform developed on the basis of PowerCAM. It has powerful functions, simple operation, and compatibility with various design file formats.

性能 / 型号	Performance/model	SK-LC600
加工速度	Processing speed	15000Hole/h or 22000Hole/h
X/Y 轴行程	X/Y axis travel	500*500mm 可定制 (Customizable)
钢片厚度	Steel sheet thickness	0.02~0.6mm
定位精度	Positioning accuracy	±3μm (X & Y)
重复精度	Repeat accuracy	±1μm (X & Y)
激光波长	Wavelength	1070nm
激光频率	Laser frequency	0~50KHz
供电电源	Power supply	AC220V±10%/1PH/50Hz
机器尺寸 (长 * 宽 * 高)	Machine size (L*W*H)	1193*1140*1660mm
机器重量	Machine weight	2500Kg

# 高速精密激光切割机

## HIGH SPEED PRECISION LASER CUTTING



本机主要针对薄板的高速高精度激光加工，整机运行稳定，技术成熟，切割效率高，设备主机整体刚性好，强度高，具备良好的加速性能，有效的防止结构变形。

This machine is mainly for high-speed and high-precision laser processing of thin plates. The whole machine runs stably, mature technology, high cutting efficiency, nice overall rigidity of the equipment host, high strength, good acceleration performance, and the structural deformation is effectively prevented.

- 支持加工次序浏览，支持断点记忆，允许对部分图形加工，支持圆管切割和平面切割。
- 支持多种图形数据，可进行自动优化，自动区分内外模和排序等，也可手动执行操作。
- 强大的料库功能，可保存工艺参数供相同材料反复使用。
- Support processing order browsing, support break point memory, allow partial graphics processing, support round tube cutting and plane cutting.
- Support a variety of graphic data, can be automatically optimized, automatically distinguish between internal and external modes and sorting, etc.
- Powerful library function that saves all process parameters for repeated use of the same material.

广泛应用于首饰珠宝、钟表眼镜、灯饰、厨卫产品、数码产品、汽车配件、精密仪器仪表、电子元件、家电、医疗器械、手机通讯、五金结构件等行业。

Widely used in jewelry, watch and glasses, lighting, kitchen and bathroom products, digital products, vehicle parts, precision instruments and meters, electronic components, household appliances, medical devices, mobile phone, hardware structure and other industries.

适用于多种金属板材、管材，不锈钢、碳钢、锰钢、铜板、铝板、镀锌板、各种合金板、稀有金属等材质的快速切割。

It is suitable for fast cutting of various metal plates, pipes, stainless steel, carbon steel, manganese steel, copper plate, aluminum plate, galvanized sheet, all kinds of alloy plates, rare metals and other materials.

性能 / 型号	Performance/model	SK-FQCW150	SK-FQCW300	SK-FQCW450
最大激光功率	Max. laser power	150W	300W	450W
XYZ 轴有效行程	XYZ axis effective area	600(X)*600(Y)*100(Z)mm 可定制 (Customizable)		
最大加速度	Max. acceleration	1.5G		
XY 轴快速移动速度	XY axis fast moving speed	60m/min		
定位精度	Positioning accuracy	±0.02mm		
重复定位精度	Repetition precision	±0.005mm 配直线电机 (With linear motor)		
供电电源	Power supply	AC220V±10%/1PH/50Hz		
机器尺寸 (长 * 宽 * 高)	Machine size (L*W*H)	1800*1430*1880mm		
机器重量	Machine weight	1500Kg		

## 隔离膜三合一切割机

Three-in-one cutting machine for separator

本设备采用高功率 CO2 激光器搭载高速振镜实现隔离膜高速切割方案，根据隔离膜的长度采用多头激光束高精度拼接无接触加工，随着光束在隔离膜上连续高速移动形成宽度极窄的切缝。与传统的机械加工相比，具有无工具磨损、一次切割长度灵活、热影响区小和运营成本低、自动化程度高等优势。

This equipment adopts high-power CO2 laser equipped with high-speed galvanometer to achieve high-speed cutting for the diaphragms, and adopting multi-head laser beams according to the length of the diaphragms to realize high-precision splicing and non-contact processing, and forming a slit of extremely narrow width with the continuous high-speed movement of the light beam on the diaphragms. Compared with the traditional mechanical processing, it has the advantages of no tool wear, flexible cutting length at one time, small heat-affected zone, low operation cost, high degree of automation and so on.

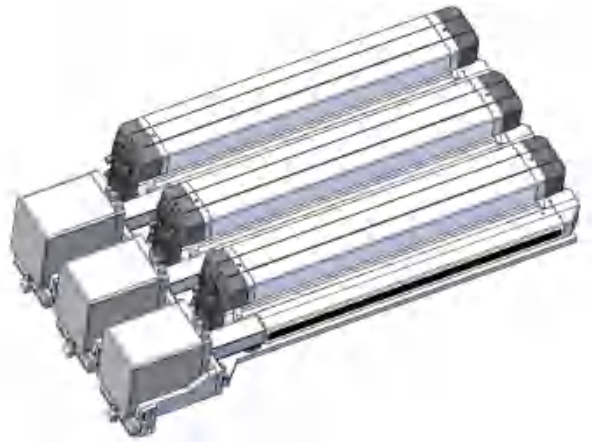
- 切割速度快，热影响区小，材料热变形小，自动化程度高。
- 控制软件可开通飞行功能实现在线飞行切割。
- 可配 CCD 同轴监视器，方便观察效果。
- 可配高效烟雾净化器，有效收集烟尘。
- Faster cutting speed, smaller heat-affected zone, smaller thermal deformation of the material and higher degree of automation.
- Control software can adopt the flying function to achieve online flying cutting.
- Can be equipped with CCD coaxial monitor, which is convenient to observe.
- Can be equipped with high-efficient smoke purifier, which can effectively collect smoke and dust.

广泛应用于新能源电池、医药、电子、食品、化工等行业。

Widely used in new energy battery, pharmaceutical, electronics, food, chemical and other industries.

适用于新能源锂电池隔离膜切割，可配合自动化，采用单工位或多工位激光同时切割，可实现在线切割。

Suitable for new energy lithium battery separator cutting, cooperating with automation, and adopting single or multi-station laser to cut at the same time, which can achieve online cutting.



性能	Performance	参数 Parameter	
最大激光器功率	Max. laser power	250W	450W
激光器类型	Laser type	CO2	CO2
冷却方式	Cooling	水冷 Water	水冷 Water
环境温度范围	Temperature range	5-40°C	5-40°C
供电电源	Power supply	AC380V±10%/50Hz	AC380V±10%/50Hz
机器尺寸(长*宽*高)	Machine size (L*W*H)	1240*710*250mm	1536*714*257mm
机器重量	Machine weight	170Kg	260Kg

# 超硬材料激光切割机

## SUPERHARD MATERIAL LASER CUTTING



本设备主要对超硬材料刀具复合片、陶瓷、单晶等切割面质量要求较高的产品进行激光切割，可选配 CCD 同轴监视器。精密三轴运动工作台和工业控制计算机系统组成。自行研制新版软件系统，功能强大，也可用 CAD 图形自动编程，切面光滑，装夹方便。

This machine mainly cuts on products with high requirements on the quality of cutting surfaces such as super-hard material tool composite sheets, ceramics, single crystals, etc., within CCD coaxial monitor. It consists of a precision three-axis motion table and an industrial control computer system. The new version of the software system is developed by itself, and it can be automatically programmed with CAD graphics. The cutting surface is smooth, the clamping is convenient.

- 光束质量好，加工效率高，切缝精细。
- 垂直度好，切割面垂直度小于 1.5°。
- 切缝窄、良品率高，切缝边棱平直，热损伤小。
- Good beam quality, high processing efficiency, fire cutting slits.
- Good verticality, and the perpendicularity of the cutting surface is less than 1.5°.
- Narrow cutting slit, high yield, straight edge of cutting slit, small thermal damage .

广泛应用于磨具、刀具等行业。

Widely used in abrasives, cutting tools and other industries.

适用于 PCD 拉丝模、PCD 复合片、CVD、各种 PCBN、单晶钻石、陶瓷、硅片、硬质合金、薄钢板等各种材料的高效切割和精密加工。

It is suitable for high efficient cutting and precision machining of PCD drawing die, PCD laminate, CVD, various PCBN, single crystal diamond, ceramics, silicon wafer, cemented carbide, thin steel plate and other materials.

性能 / 型号	Performance/model	SK-LC150	SK-LC300	SK-LC450
脉宽	Pulse width	0.05~20ms		
重复频率	Repeat frequency	1-3000Hz		
1.6mmPCD 切割速度	1.6 mm PCD cutting speed	≥120mm/min	≥240mm/min	
2.0mmPCD 切割速度	2.0mm PCD cutting speed	≥70mm/min	≥180mm/min	
切缝宽度	Kerf width	≤0.1mm		
热影响区	Heat influence range	≤0.05 mm		
PCD 单面最大切割厚度	PCD Max. thickness of single surface cutting	3mm	5mm	
PCD 双面最大切割厚度	PCD Max. thickness of double-sided cutting	5mm	8mm	
供电电源	Power supply	AC220V±10%/1PH/50Hz		
机器尺寸 (长 * 宽 * 高)	Machine size (L*W*H)	1550*950*1750mm		
机器重量	Machine weight	300Kg		

# 手持式激光清洗机

## HANDHELD LASER CLEANING

本机是新一代表面清理的高科技产品。易于安装、操控和实现自动化。可进行无化学试剂、无介质、无尘、无水的清洗，表面洁净度高，能够清除物件表面树脂、油污、污渍、污垢、绣浊、涂层、镀层、油漆。

This machine is a new type of high-tech products for surface cleaning, can be cleaning without chemical reagent, medium, dust and water, and the surface clearness is quite good, also can remove the resin, grease, stains, dirt, embrodered turbidity, coating, paint from the products surface.

- 无研磨、非接触，高效环保、无化学污染，几乎无损伤基材表面。
- 可设置出光宽度，清洗精准。
- 操作方便，通电即用，无耗材。
- 可调激光参数，适用多种环境，效果更佳。
- No grinding, non-contact characteristics, efficient and environmentally friendly, no chemical pollution, and almost no damage to the surface of the substrate.
- Can set the light width, and accurately cleaning.
- Easy to operate, can use when powered on and no consumables.
- Adjustable laser parameters for a variety of environments, and has better results.

广泛应用于模具行业、汽车制造、船舶业、食品加工、污水处理、橡胶轮胎、石油化工等行业。  
Widely used in mold industry, automobile manufacturing, shipbuilding industry, food processing, wastewater dispose, rubber tires, oil, chemical industry, etc.

适用于金属表面除锈、表面除漆脱漆处理、表面油污、污渍、污垢清洗、表面镀层、涂层清除、焊接面预处理、喷涂面预处理、石像表面灰尘及附着物清除、橡胶模具残留物清理。  
Suitable for metal surface rust removal, surface paint removal, surface oil and dirt cleaning, surface cleaning, welding surface pre-treatment, spray surface pre-treatment, stone surface dust and attachments removal, rubber mold residue cleaning.



性能 / 型号	Performance/model	SK-CL200	SK-CL500	SK-CL1000
最大激光功率	Max. laser power	200W	500W	1000W
激光波长	Wavelength	1064nm		
冷却方式	Cooling	风冷 Air		
焦深	Focal depth	±2.5mm		
机型选配	Model	手持式 Handheld		
供电电源	Power supply	AC220V±10%/1PH/50Hz		
机器尺寸(长*宽*高)	Machine size(L*W*H)	500*230*520mm		
整机重量	Weight	35KG		



# 高功率激光清洗机

## HIGH POWER LASER CLEANING



本机是新一代表面清理的高科技产品。易于安装、操控和实现自动化。可进行无化学试剂、无介质、无尘、无水的清洗，表面洁净度高，能够清除物件表面树脂、油污、污渍、污垢、绣油、涂层、镀层、油漆。

This machine is a new type of high-tech products for surface cleaning, can clean without chemical reagent, medium, dust and water, and the surface clearness is quite good, also can remove the resin, grease, stains, dirt, embroidered turbidity, coating, paint from the products surface.

- 无研磨、非接触，高效环保、无化学污染,无耗材，几乎无损伤基材表面。
- 可设置出光宽度，清洗精准。
- 振镜可选 180°或 90°安装方式，操作方便，通电即用。
- 可调激光参数，适用多种环境，效果更佳。
- No grinding , non-contact characteristics , efficient and environmentally friendly , no chemical pollution , and almost without damage to the surface of the substrate.
- Can set the light width , cleaning accuracy.
- Easy to operate, use when powered on and no consumables.
- Adjustable laser parameters for a variety of environments , better results.

广泛应用于新能源电池、模具行业、汽车制造、船舶业、食品加工、污水处理、橡胶轮胎、石油化工等行业。

Widely used in new energy batteries, mold industry, automobile manufacturing, shipbuilding industry, food processing, wastewater dispose, rubber tires, oil, chemical industry, etc.

适用于金属表面除锈、表面除漆脱漆处理、表面油污、污渍、污垢清洗、表面镀层、涂层清除、焊接面预处理、喷涂面预处理、石像表面灰尘及附着物清除、橡胶模具残留物清理。

Suitable for metal surface rust removal, surface paint removal, surface oil and dirt cleaning, surface cleaning, welding surface pre-treatment, spray surface pre-treatment, stone surface dust and attachments removal, rubber mold residue cleaning.

性能 / 型号	Performance/model	SK-CL250	SK-CL300	SK-CL500
最大激光功率	Max. laser power	250W	300W	500W
激光波长	Wavelength	1064nm	1064nm	1064nm
振镜安装方式	Installation method	180° / 90°	180° / 90°	180° / 90°
冷却方式	Cooling	风冷 Air	风冷 Air / 水冷 Water	水冷 Water
机型选配	Model	自动化 Automation		
供电电源	Power supply	AC220V±10%/1PH/50Hz		
电气柜尺寸(长*宽*高)	Machine size (L*W*H)	1300*750*1200mm		
整机重量	Weight	150-200Kg		

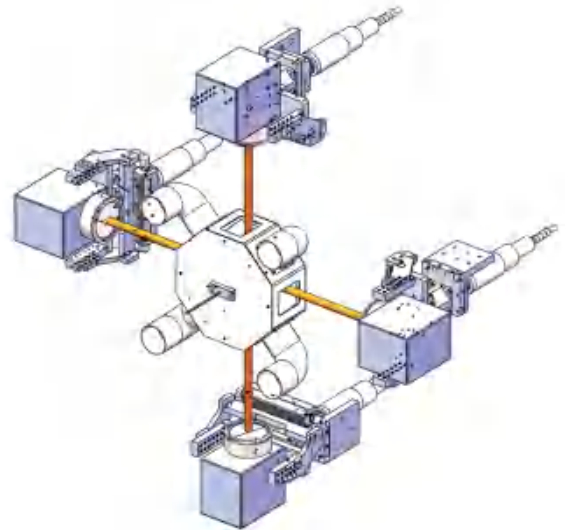
# 扁铜线激光去漆解决方案

## LASER PAINT REMOVAL SOLUTION FOR HAIRPIN

本方案可根据客户不同要求，灵活配置激光光学和工艺方案，可提供基材近无损工艺方案。光学元器件自主选型优化设计、加工及装配，核心激光控制系统自主开发。

The programme can be flexibly configured with laser optics and process solutions according to different requirements, which can provide the near nondestructive process solution for the substrate. The optical components are all designed, processed and assembled internally, and the core laser control system is also developed independently.

- 丰富的激光去漆系统集成和应用经验可做到全区域无残留
- 清洗系统可以长期稳定使用，运行成本低
- 高度集成、可搭载双头、四头光纤和CO2激光清洗设备组合方案
- 激光清洗效率高，节省时间
- Plentiful experience in the integration and application of laser paint removal systems to achieve a residue-free whole area
- The cleaning system can be used stably for a long time with low operating costs
- Highly integrated, available dual-head, quad-head and composed CO<sub>2</sub> laser cleaning equipment
- Higher laser cleaning efficiency and time saving



广泛应用于新能源电池、模具行业、航空航天、汽车制造、船舶业、污水管处理、橡胶轮胎等行业。

Widely used in new energy batteries, mold industry, aerospace, automotive manufacturing, marine industry, sewage pipe treatment, rubber tires, and other industries.

适用于驱动电机扁铜线的清洗，针对PEEK材料、PI材料漆包线漆层进行清洗，清洗区域热影响小，清洗边缘效果优，清洗速度快、效率高。

Suitable for driving motor hairpin cleaning, targeting at PEEK, PI material enamelled wire lacquer layer cleaning. The thermal influence of cleaning area is small, edge effect is excellent, and also with high-speed and high-efficiency.

性能 / 型号	performance / model	SK-CL250H	SK-CL350H	SK-CL500H
最大激光功率	Max. laser power	≤250W	≤350W	≤500W
激光波长	Wavelength	1064nm	1064nm	1064nm
振镜安装方式	Installation method	180° / 90°	180° / 90°	180° / 90°
冷却方式	Cooling	水冷 Water	风冷Air / 水冷Water	水冷 Water
供电电源	Power supply	AC220V±10%/1PH/50Hz		
整机重量	Weight	20-30KG		

# 精密激光打孔机

## PRECISION LASER DRILLING



本机是针对实验室压力试验课题专业定制的一款高精度激光设备，具有兼容铼片加压前后的各种打孔、切割的特点。

This machine is a high-precision laser equipment customized for laboratory pressure testing. The device is compatible with various punching and cutting features before and after the rhenium sheet is inserted.

- 设备体积小，解决了个别科室空间狭小问题。
- 精密度高，最小孔可达到 0.005mm。
- 设备操作简便，更易上手。
- 可根据不同材料更换光源，兼容性能更强。
- 热影响区域小，小孔周边的氧化成分较少。
- The size of equipment is small , which solves the problem of small space in some departments.
- High precision, the smallest hole can reach 0.005mm.
- The equipment is easy to operate and easier to use.
- The light source can be replaced according to different materials, and the compatibility is stronger.
- Small heat-affected zone , and the oxidized components around the small holes are less.

广泛应用于金刚石拉丝模、消声器小孔、针头小孔、宝石轴承等多种打孔的行业。

Widely used in drilling the diamond wire drawing dies, the muffler holes , needle holes , and jewel bearings etc.

适用于对天然金刚石、聚晶金刚石、红宝石、紫铜、陶瓷、不锈钢、碳钢、合金钢等超硬、耐高温材料进行不同形状、直径、深度和锥度打孔。

It is suitable for drill holes of different shapes, diameters, depths and tapers on super-hard and high temperature resistant materials, such as natural diamond, polycrystalline diamond, ruby, copper, ceramic, stainless steel, carbon steel, alloy steel and so on.

性能 / 型号	Performance/model	SK-MS1
最大激光功率	Max. laser power	20W
激光波长	Wavelength	1064nm
脉冲频率	Pulse frequency	1.6-1000kHz
最小光斑直径	Min. spot diameter	0.005mm
重复精度	Repeat accuracy	±0.001mm
加工范围	Processing range	50*50mm
供电电源	Power supply	AC220V±10%/1PH/50Hz
机器尺寸 (长*宽*高)	Machine size (L*W*H)	700*450*750mm
机器重量	Machine weight	75Kg

本机由高性能激光器、CCD 同光路监视器、精密四轴运动工作台和自行研发软件控制系统组成，自动完成拉丝模小孔成形，对孔形编程，可打多层直线喇叭孔、直孔，特殊设计软件还可打出轴向内壁圆弧异形及其它任意曲线孔形。

This machine is composed of the high-performance laser, CCD optical television surveillance, precise 4 axis movement workbench and independently developed software control system. It automatically completes the drilling of wire drawing dies. The hole shape can be programmed, so it can punch not only multilinetrumpet holes, straight holes, but also axial inner wall arc and strange or arbitrary curve shape holes through special software. The wall of drilled holes is smooth and the ablation zone is small.

- 更短的波长，更小的激光焦点，烧蚀区少，孔内壁光滑。
- 可打反孔，装夹方便，打孔速度快，长期工作稳定可靠。
- 自行研制新版软件系统，自动完成拉丝模小孔成型。
- Shorter wavelengths, smaller laser focus, less ablation zones, and smoother inner walls.
- Also can drill from back, the clamping is convenient, the drilling speed is fast, and the long-term work is stable and reliable.
- The new version of the software system has been developed by ourselves, automatically completes the drawing of small holes in the wire dies.

广泛应用于金钢石拉丝模、消声器小孔、针头小孔、宝石轴承等多种打孔的行业。

Widely used in drilling the diamond wire drawing dies, the muffler holes, needle holes, and jewel bearings etc.

适用于对天然金钢石、聚晶金钢石、红宝石、紫铜、陶瓷、不锈钢、碳钢、合金钢等超硬、耐高温材料进行不同形状、直径、深度和锥度打孔。

It is suitable for drill holes of different shapes, diameters, depths and tapers on super-hard and high temperature resistant materials, such as natural diamond, polycrystalline diamond, ruby, copper, ceramic, stainless steel, carbon steel, alloy steel and so on.



性能 / 型号	Performance/model	SK-DRILLING				
最大激光功率	Max. laser power	3W	5W	20W	50W	100W
激光波长	Wavelength	355nm	532nm	1064nm		
打孔孔径	Drilling aperture	0.006-1mm		0.05-1mm	0.1-3mm	0.1-5mm
打孔厚度	Perforation thickness	0.01-1mm		0.05-2mm	1-6mm	1-10mm
旋转速度	Rotation speed	<2000 转 /min				
初始定位精度	Initial positioning accuracy	±0.003mm				
重复定位精度	repetition precision	±0.002mm				
供电电源	Power supply	AC220V±10%/1PH/50Hz				
机器尺寸(长*宽*高)	Machine size (L*W*H)	1100*1000*1600mm				
机器重量	Machine weight	400Kg				

# 激光划片机

## LASER SCRIBING



本机切缝细、热影响区小、切口边缘平整光滑、无裂纹。可以在 AutoCAD、CorelDRAW 中绘制图形导入后进行加工；专用控制软件使程序的编辑和修改简便，实时显示运动轨迹。配备吸尘、CCD 监视系统及真空吸附系统。

This machine can scribe small slits, small heat affected zone, smooth slit edge without cracks. Can be drawn in AutoCAD, CorelDRAW after importing graphics processing; dedicated control software makes editing and modification of the program easy, real-time display shows the motion track. Equipped with vacuum, CCD monitoring and vacuum adsorption system.

- 激光划线宽度细，切割断面整齐，边缘平整光滑。
- 可选配高精度 CCD 视觉定位系统，高速振镜划片，划片速度快。
- 可选配料盒自动传输、电池片自动上料、自动定位、自动划片、成品自动装盒等系统，自动化程度高。
- Small scribing width, and the cut section of the cell sheet is more neat, and the edge is smoother.
- Optional high-precision CCD visual positioning system, high-speed galvanometer scribing with fast speed.
- Automatic transfer of optional ingredient boxes, automatic feeding of battery sheets, automatic positioning, automatic dicing, automatic loading of finished tablets. Such as the system, High degree of automation.

广泛应用于太阳能电池等行业。

Widely used in solar cells and other industries.

适用于单晶硅、多晶硅、非晶硅太阳能电池划片，陶瓷、金刚石的切割，硅、锗、砷化镓和半导体基片、半导体器件和集成电路的氧化陶瓷基片（如陶瓷基板）划片；薄金属模板的精密切割、打孔，SMT 贴片机模板的切割。

It is suitable for monocrystalline silicon, polycrystalline silicon, amorphous silicon solar cell dicing, ceramic, diamond cutting, oxide ceramics for silicon, germanium, gallium arsenide and semiconductor substrates, semiconductor devices and integrated circuits substrate (such as ceramic substrate) dicing; precision cutting and punching of thin metal template, SMT stickers cutting of the tablet template.

性能 / 型号	Performance/model	SK-SCF20	SK-SCF30	SK-SCUV3	SK-SCUV5
最大激光功率	Max. laser power	20W	30W	3W	5W
激光波长	Wavelength	1064nm		355nm	
冷却方式	Cooling	风冷 Air		水冷 Water	
最大划片速度	Max.scribing speed	200mm/s			
划片精度	Scribing accuracy	±0.5%			
划片线宽	Scribing line width	≤30μm		≤15μm	
供电电源	Power supply	AC220V±10%/1PH/50Hz			
机器尺寸 (长*宽*高)	Machine size (L*W*H)	1250*700*1700mm			
机器重量	Machine weight	200Kg			

# 全息幻彩激光雕刻机

## HOLOGRAPHIC LASER ENGRAVING

本机主要功能为激光全息幻彩雕刻工艺，它是通过使用高能激光束，在模具表面蚀刻出高精度的线条，使纪念币表面呈现出多层次光效，色彩绚丽，形象逼真，立体感强。

This machine is holographic laser engraving technology, it uses of high-energy laser beams, etched on the surface of the mold high-precision lines, so that the commemorative coin surface presents a multi-level light effect, colorful, vivid image, three-dimensional sense.

- 激光全息折光技术可对七彩光进行定色、定向雕刻。
- 图案颜色呈现彩虹效果，防伪级别高。
- 全息幻彩激光雕刻模具后转印至产品表面，形成幻彩效果。
- 自主研发设计结构及运动平台，重复精度高，稳定性好。
- 自主知识产权软件控制系统，操作界面人性化。
- Laser engraving holographic refraction technology enables color and directional laser engraving can be realized.
- The color of the pattern has a rainbow effect, high anti-counterfeiting level.
- It can be engraved on the mold and transferred to the surface of the product, forming a magic effect.
- Self-developed design structure and motion platform solution with high repeatability and good stability.
- Independent intellectual property rights software control system, humanizing operation interface.



广泛应用于全息防伪标签、高档汽车部件 LOGO 标识、高档 3C 通讯产品、高档礼品定制、高档五金卫浴、电梯等行业。  
Widely used in holographic anti-counterfeiting label、high grade auto parts LOGO、high grade 3C communication products、high-end gift customization、high grade hardware bathroom、elevator industry.

适用于全息（幻彩）金银币、激光模压全息印刷、贵金属金银钞 / 卡、金章、金条、银章、银条、模具、邮票等贵金属或珠宝首饰。

It is suitable for holographic (magic color) gold and silver coins, laser embossed holographic printing, precious metal gold and silver banknotes / cards, gold stamps, gold bars, silver stamps, silver bars, molds, Stamps, such as precious metals or jewelry industry.

项目	Project	SK-MARKER
整机功耗	Power consumption	1000W
激光波长	Wavelength	1030-1064nm
冷却方式	Cooling	水冷 Water
光束质量 M <sup>2</sup>	Beam quality M <sup>2</sup>	≤1.2
工作温度	Working temperature	20-28°C
存储温度	Storage temperature	0-50°C
供电电源	Power supply	AC220V±10%/1PH/50Hz
机器尺寸(长*宽*高)	Machine size (L*W*H)	1600*1800*2150mm
机器重量	Machine weight	1500Kg

# 三维动态激光打标机

## 3D DYNAMIC LASER ENGRAVING



本机适合于大弧面高落差的三维产品雕刻，搭载三轴控制“3-AXIS”自由控制焦距，在任何形状上均可高精度刻印，可应对各种阶梯面，实现各种形状的无差别打标。切换设定就可应对不同产品的焦距、位置和形状变化。无需移动工件即可完成切换工作。可选用 3D 曲面标刻、浮雕、视觉定位系统、动态流水线打标等多种功能。

This machine is suitable for three-dimensional product engraving with large arc surface height drop. It is equipped with three-axis control "3-AXIS" to control the focal length freely. It can be printed with high precision in any shapes. It can cope with various step surfaces and realize various shapes in differential marking. Switch settings to handle changes in focus, position and shape for different products. Switching can be done without moving the workpiece. 3D surface marking, embossing, visual positioning system, dynamic pipeline marking and many other functions are available.

- 高精度三维定位技术，高速聚焦与扫描系统。
- 三维图形处理技术，适用于 dxf、plt、cnc、step、iges 等多种格式文件。
- 不同高度平面标记和浮雕功能，打标速度快，加工效率高。
- High precision of 3D positioning technology, high-speed focusing and scanning system.
- 3D graphics processing technology, it is suit for many file formats, such as dxf, plt, cnc, step, iges, etc;
- Different height flat marks and embossing functions, fast marking speed and high processing efficiency.

广泛应用于手机制造、立体电路、医疗器械、模具、3C 电子、汽车零部件、电子通讯等行业产品的激光三维打标。  
Widely used in industries such as mobile phone manufacturing, stereoscopic circuits, medical devices, molds, 3C electronics, automotive parts, and electronic communication for laser 3D marking of products.

适用于三维曲面的各种金属或非金属产品。

It is suitable for kinds of metal or non-metal products which has 3D surface.

性能 / 型号	Performance/model	SK-3DF50	SK-3DF100	SK-3DC100	SK-3DC-150
最大激光功率	Max. laser power	50W	100W	100W	150W
激光波长	Wavelength	1064nm		9300/10200/10600nm	
冷却方式	Cooling	风冷 Air		水冷 Water	
光束质量 M <sup>2</sup>	Beam quality M <sup>2</sup>	<1.3		<1.8	
标记范围	Marking scope	100*100*20 mm~600*600*80mm			
打标方式	Marking mode	XYZ 三轴动态聚焦 /XYZ three-axis dynamic focus			
供电电源	Power supply	AC220V±10%/1PH/50Hz			
机器尺寸 (长*宽*高)	Machine size (L*W*H)	1420*1400*1832mm			
机器重量	Machine weight	300Kg			

# 紫外激光打标机

## UV LASER MARKING

本机采用半导体端面泵浦激光器，经过三倍频产生 355nm 紫外激光。光电转化率高，设备稳定性好，振镜式高精度打标头，效果精细，355nm 输出波长，减少对加工工件的热影响。

This machine uses a semiconductor end-pumped laser to generate 355nm ultraviolet laser after triple frequency. It boasts high conversion rate between laser and electricity. High stability and it adopts galvo marking head with super precision. Output wavelength is 355nm. It boasts small heat affection.

- 效率高，打标效果好，整机小巧，运输便捷。
- 电光转换效率高，激光器脉宽窄，峰值功率高。
- 热影响区域小，适合高精度加工的划线及各种复杂图案打标，速度快，整机稳定性好。
- High efficiency and good marking effect, small size, for convenient transportation;
- High electro-optic conversion efficiency, narrow laser pulse width, high peak power.
- Small heat affected area, suitable for high-precision machining of scribing and various complex pattern marking fast, good stability.



广泛应用于食品、药品、化妆品、电线等高分子材料的包装瓶（盒）表面打标，打微孔（孔径  $D \leq 10\mu\text{m}$ ）柔性 PCB 板、LCD、TFT 打标、划片切割等金属或非金属镀层去除硅晶圆片微孔、盲孔加工。

Widely used in marking on packing materials of food, medicines, cosmetics and wire, drilling tiny hole (hole diameter  $D \leq 10\mu\text{m}$ ) Flexible PCB, LCD, TFT marking and scribing. Thin film removal for metal or non-metal products. Silicon wafer tiny hole and dead hole processing.

适用于玻璃、高分子材料等物体表面打标，微孔加工。

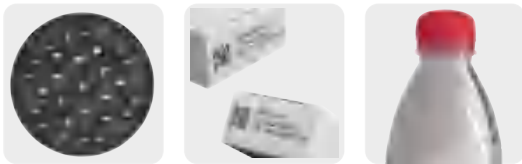
It is suitable for the surface marking of glass, polymer materials, etc., micro-hole processing.

性能 / 型号	Performance/model	SK-UV3	SK-UV5	SK-UV10
最大激光功率	Max. laser power	3W	5W	10W
激光波长	Wavelength	355nm		
冷却方式	Cooling	风冷 / 水冷 Air/Water	水冷 Water	
标记范围	Marking scope	100*100/150*150/200*200mm 可定制 (Customizable)		
重复精度	Repeat accuracy	<2 $\mu\text{rad}$		
光束质量 $M^2$	Beam quality $M^2$	<1.2		
供电电源	Power supply	AC220V $\pm$ 10%/1PH/50Hz		
机器尺寸 (长 * 宽 * 高)	Machine size (L*W*H)	950*675*1500mm		
机器重量	Machine weight	150Kg		



# CO2激光喷码机

## CO2 LASER MARKING



本机采用 CO2 射频激光器和高速扫描振镜系统。整机系统打标精度高、速度快、性能稳定，可应用于大批量在线加工流水线生产线。

This machine uses a CO2 RF laser and a high-speed scanning galvanometer system. The marking system machine has high precision, high speed and stable performance, and can be applied to large-scale online processing flow production line.

- 高性能 CO2 激光器，标刻质量好，加工速度快，产能高。
- 可配高精度 CCD 实现自动定位、读码。
- 机身结构紧凑，升降平台稳定，占地面积小。
- 光斑质量好，光功率密度均匀，输出光功率稳定，出现异常自动报警和暂停作业。
- High performance import CO2 laser source, good marking quality, fast processing speed and high productivity.
- It can be equipped with high-precision CCD to realize automatic positioning and reading.
- The structure of the fuselage is compact, the lifting platform is stable, small footprint.
- Good spot quality, uniform optical power density, stable output optical power, abnormal automatic alarm and pause operation.

广泛应用于食品饮料、化妆品、医药、香烟、电子元件、服装、工艺礼品等行业领域。

Widely used in food and beverage, cosmetics, medicines, cigarettes, electronic components, clothing, craft gifts and other industries.

适用于亚克力、有机玻璃、竹木器、树脂、塑料、橡胶、纸张、布料服装、皮革、陶瓷、人造石等材质的打标、雕刻、镂花。

It is suitable for marking plexiglass, bamboo and wood, resin, plastic rubber, paper, cloth clothing, leather, ceramics, artificial stone and other materials.

性能 / 型号	Performance/model	SK-C10	SK-C30	SK-C60	SK-C100
最大激光功率	Max. laser power	10W	30W	60W	100W
激光波长	Wavelength	9300/10200/10600nm			
冷却方式	Cooling	风冷 Air			水冷 Water
光束质量 M <sup>2</sup>	Beam quality M <sup>2</sup>	<1.2			
标记范围	Marking scope	110*110/140*140/200*200/400*400mm 可定制 (Customizable)			
最小线宽	Min. line width	0.1mm			
供电电源	Power supply	AC220V±10%/1PH/50Hz			
机器尺寸 (长 * 宽 * 高)	Machine size (L*W*H)	900*450*1400mm / 1000*600*1450mm			
机器重量	Machine weight	70Kg / 150Kg			

本机采用高度集成的光纤激光器、高速扫描振镜。输出功率稳定，光学模式好，适用于精细、精密打标，体积小、全风冷、无耗材、免维护、满足工业化连续工作要求；可根据要求选配进口或国产激光器。

This machine adopts highly integrated fiber laser and high speed scanning galvanometer. Output power is stable, optical mode is good, and is suitable for precision marking; Small size, all air-cooled, consumable, maintenance-free, which can meet the needs of industrial continuous work; and can be matched according to the requirements of imported or domestic laser.

- 可对多种金属、非金属材料进行标刻。
- 属于非接触加工、不损坏产品、无刀具磨损、标记质量好。
- 光束质量好、损耗低、加工热影响区小。
- 加工效率高、采用计算机控制、易于实现自动化。
- It can process a variety of metal and non-metal materials.
- Non-contact processing, no damage to the product, no tool wear, good marking quality.
- Good beam quality, less material loss, and the processing heat affected zone is small.
- High processing efficiency, computer control, easy to achieve automation.



广泛应用于塑胶透光按键、集成电路 (IC)、数码产品部件、精密机械、珠宝首饰、洁具、量具刀具、钟表眼镜、电子元器件、五金饰品、五金工具、手机通讯部件、汽摩配件、塑胶制品、医疗器械、建材管材等高精度产品标识行业。

Widely used in mobile communications, electronic components, household appliances, watch glasses, aerospace, auto parts, precision instruments, medical devices, jewelry, hardware and other industries.

适用于高硬合金、电镀产品、镀膜产品、ABS、环氧树脂、油墨涂覆产品，陶瓷、工程塑料等。

It is suitable for hard alloys, plated products, coated products, ABS, epoxy resin, ink coated products, ceramics, engineering plastics and so on.

性能 / 型号	Performance/model	SK-F20	SK-F30	SK-F50	SK-F100
最大激光功率	Max. laser power	20W	30W	50W	100W
激光波长	Wavelength	1064nm			
冷却方式	Cooling	风冷 Air			
光束质量 M <sup>2</sup>	Beam quality M <sup>2</sup>	<1.3			
最小线宽	Min. line width	0.03mm			
标记范围	Marking scope	100*100/150*150/200*200mm 可定制 (Customizable)			
供电电源	Power supply	AC220V±10%/1PH/50Hz			
机器尺寸 (长 * 宽 * 高)	Machine size (L*W*H)	750*600*1388mm / 700*240*620mm			
机器重量	Machine weight	100Kg / 30Kg			

# 样品展示

## SAMPLES



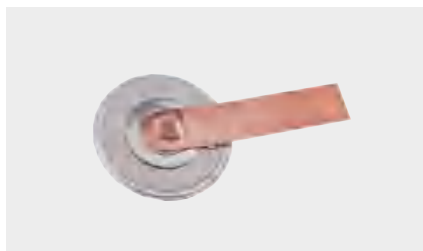
模组外罩焊 Module outer cover welding



电芯软连接 Lsoft connector



汇流排焊接 Busbar welding



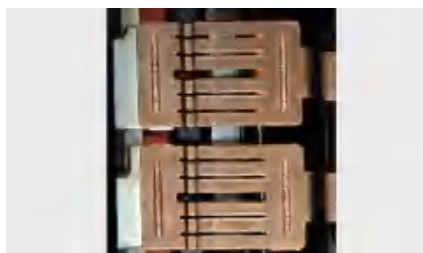
电池极柱焊接 Battery pole welding



极耳焊接 Tab welding



集流盘焊接 Collector plate Welding



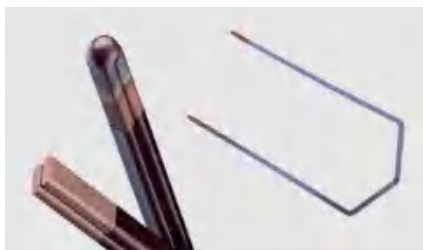
IGBT 焊接 IGBT welding



扁铜线焊接 Hairpin welding



密封焊 Hermetic welding



扁线清洗 Hairpin cleaning



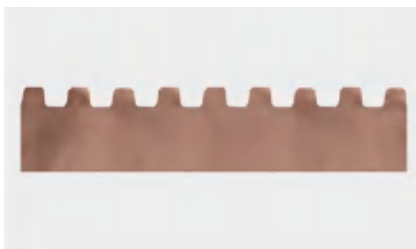
极柱电池清洗 Battery pole cleaning



油污清洗 Oil cleaning



轮胎模具清洗 Tire mold cleaning



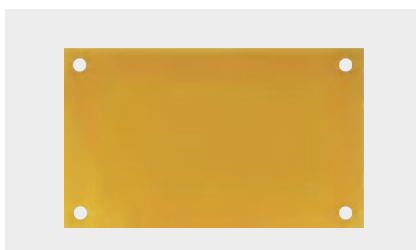
极耳模切 Tab die-cutting



隔离膜切割 Separator cutting



边框 PET膜切割 Edge PET film cutting



全氟磺酸膜切割 Sulfonic acid film cutting



车灯焊接 Lamp welding

# 样品展示

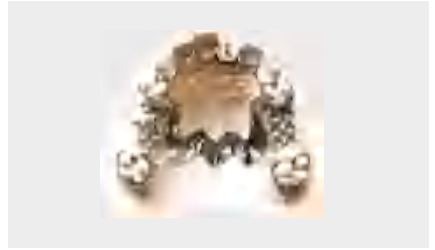
## SAMPLES



手术钳焊接 Surgical forceps welding



胎压测试仪塑料焊接 Plastic welding



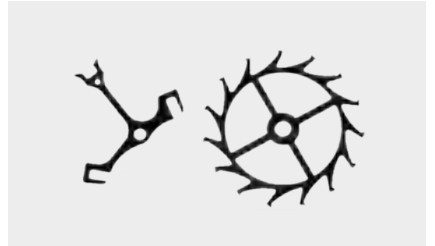
义齿点焊 Denture spot welding



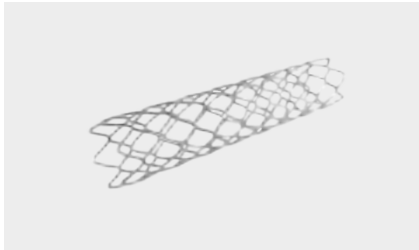
精密焊接 Precision welding



海波管切割 Hypotube cutting



手表机芯切割 Watch movement cutting



心脏支架切割 Heart stent cutting



陶瓷片切割 Ceramic slice cutting



金属箔切割 Metal foil cutting



网版划线 Screen engraving



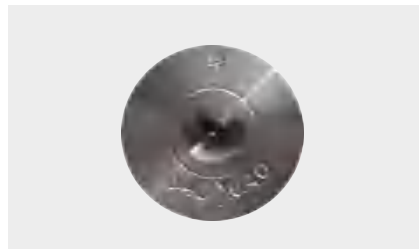
多晶硅切片 polycrystalline scribing



锥形拉丝模 Tapered wire die



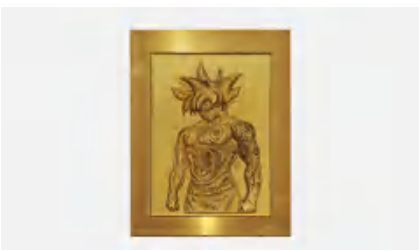
精密打孔 Precision drilling



拉丝模打孔 Wire die drilling



喷油嘴打孔 Fuel injector drilling



3D 激光标刻 3D laser marking



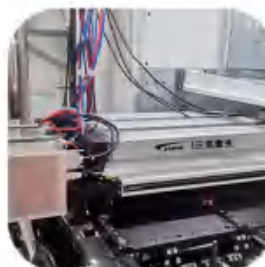
全息幻彩雕刻 Rainbow leffecting



灯罩雕刻 Shade pattern marking

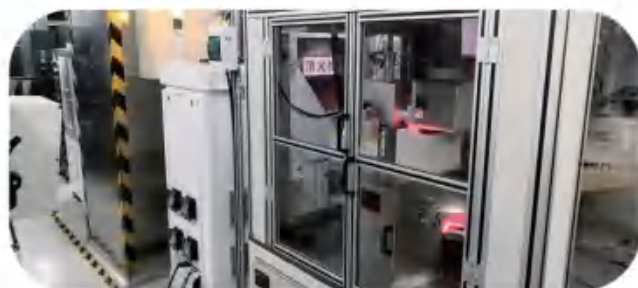
# 案例展示(部分)

PARTS OF CASES



# 案例展示(部分)

PARTS OF CASES

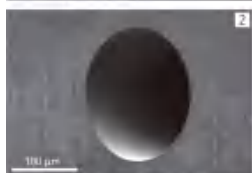


# 集成方案

## SOLUTIONS



厚度为 300 μm 薄板的灵活几何形状 (SEM 图像, 出口侧)  
Flexible geometries in 300-μm-thick steel (SEM image, exit side)



理想的圆形单孔圆孔 图 1 的直径为 200 μm 放大 (SEM 图像)  
Ideally-formed round single bore hole with  
200 μm diameter from figure 1 magnified (SEM image)



直径为 100 μm 的孔的横截面, 垂直壁厚为 200 μm 的钢轮廓 (零锥度), 处理时间 1 s  
Cross section of a 100-μm diameter bore hole in 200-μm thick steel with perpendicular  
wall contour (zero taper), process time 1 s



图 1 的细节: 椭圆孔, 长 190 μm, 宽 110 μm (SEM 图像)  
Detail of figure 1: Elliptical bore hole, 190 μm-long, 110 μm-wide (SEM image)



图 1 的细节: 复杂几何图案  
通过两个重叠的椭圆实现, 各自长 190 μm, 宽 110 μm (SEM 图像)  
Detail of figure 1: Geometric flexibility  
achieved by two overlapping ellipses, 190 μm-long and 110 μm-wide, each (SEM image)



钢中的 200 μm 钻孔, 与头发丝对比, 固定工件位置, 无 XY 平移台 (SEM 图像)  
200-μm bore holes in steel – compared to a human hair, fabricated with fixed workpiece  
position, without an XY translation stage (SEM image)



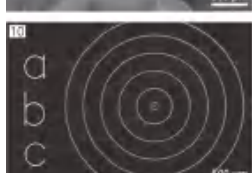
4 x 4 方孔阵列的细节在陶瓷中 - 方形几何尺寸: 30 μm x 30 μm  
- 深度: 300 μm - 长宽比: 1:10 - 垂直壁轮廓 - 圆角半径: <4 μm - 壁厚: 10 μm (SEM 图像)  
Detail of a 4 x 4 square hole array in ceramic - Square geometry: 30 μm x 30 μm  
- Depth: 300 μm - Aspect ratio: 1:10 - Perpendicular wall contour  
- Corner-rounding radius: < 4 μm - Wall thickness: 10 μm (SEM image)



300 μm 厚钢中的 200 μm 钻孔 (入口侧), 通过工件制造, 用 XY 平移台定位 (SEM 图像)  
200-μm bore hole in 300-μm thick steel (entrance side), fabricated via workpiece  
positioning with an XY translation stage (SEM image)



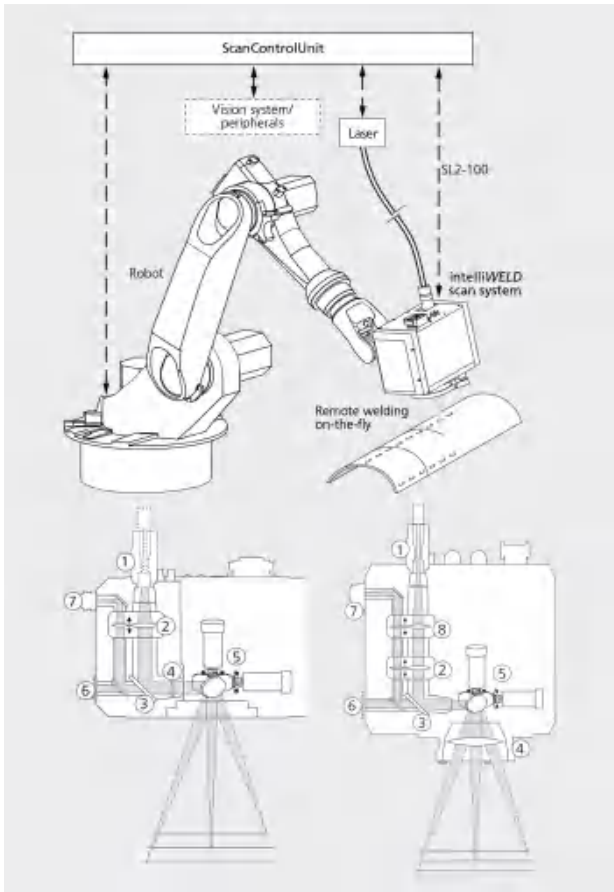
垂直切割的切割应用, 边缘轮廓采用 200 μm 厚的黄铜 (SEM 图像)  
Cutting application with perpendicular cutting  
edge contour in 200-μm thick brass (SEM image)



标记图案 - 字符: 0.5 毫米字体, 字体: SimpleStraight3  
- 圆形直径: 0mm, 0.1mm, 0.5mm, 1.0mm, 1.5mm, 2.0mm, 2.5mm  
Marking pattern for labeling - Characters: 0.5 mm font size, SimpleStraight3 font  
- Circle diameters: 0 mm, 0.1 mm, 0.5 mm, 1.0 mm, 1.5 mm, 2.0 mm, 2.5 mm

# 集成方案

## SOLUTIONS



### 前聚焦 intelliWELD PR

- 针对视觉应用进行了优化（例如角焊）
- 高透射率的 Vis/NIR 波长，适合同轴传感器照明和观察
- 观察点与处理点之间无差异（无色差）
- 扫描角度宽，图像范围大
- 高成像质量，单模式下也可与高光束质量的激光器使用
- 无需物镜，紧凑轻巧的扫描系统

### intelliWELD PR with prefocus

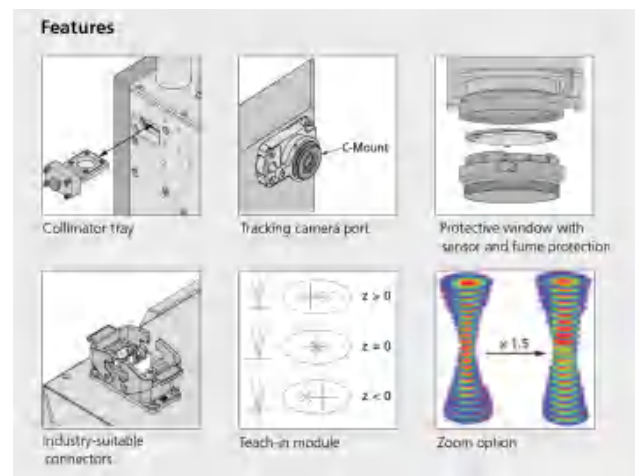
- optimized for vision applications (e.g. fillet welding)
- High transmission of Vis/NIR wavelengths, ideal for coaxial sensors, illumination and observation
- No divergence between observation points and processing points (no chromatic aberration)
- Wide scan angles possible, large image field
- High imaging quality, also usable with lasers of high beam quality, even in single mode
- No objective required, compact and lightweight scan system

### intelliWELD II FT (带 F-Theta 物镜)

- 针对重叠焊接进行了优化
- 额外的变焦轴：最大光斑可放大至  $\times 1.5$ ，动态，除散焦外可连续调整接缝
- 恒定光斑大小，同时在整个可访问体积中的所有缩放设置下改变  $x$ ,  $y$  和  $z$
- 纵横比小，即使光束质量低或光纤直径大也能产生小光斑
- III 系列振镜，漂移较低
- 新型防护窗传感器：软件控制的增益，大大缩短了激光开启时间， $< 1$  秒，集成照明，可目视检查防护窗
- 在所有  $xyz$  缩放设置下，改进了视觉端口，更明亮的图像，更清晰的相机成像

### intelliWELD II FT (with F-Theta objective)

- optimized for overlap welding
- Additional zoom axis: enlarges spot size up to  $\times 1.5$ , dynamic, continuous intra-seam adjustability, independent of/in addition to defocusing
- Constant spot size while varying  $x$ ,  $y$  and  $z$  at all zoom settings throughout the entire accessible volume
- Small aspect ratio, therefore small spots even with low beam quality or large fiber diameter
- Lower drift, thanks to III-series galvos
- New protective window sensor: software-controlled gain, significantly shorter laser-on time  $< 1$  second, integrated illumination for visual inspection of protective window
- Improved vision port, brighter image, sharp camera imaging at all  $xyz$  zoom settings





## 集成方案 SOLUTIONS



### 自动对焦激光加工

SCANalign 是专门针对用户的完整易用的视觉解决方案，为激光扫描系统而开发。SCANalign 扩展您的扫描系统对整个工作领域进行高精度校准的系统，激光的自动过程对准和视觉质量控制处理结果。

### autofocus laser processing

SCANalign is a complete, easy-to-use vision solution specifically, developed for laser scan systems.

SCANalign extends your scan system with highly precise calibration of the whole working field, automatic process alignment and visual quality control of laser processing results.

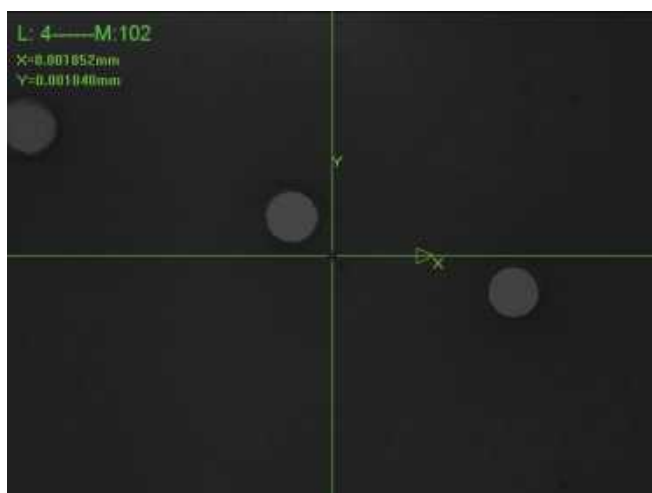


### 相机适配器

摄像机适配器可以通过摄像机观察振镜扫描头的工作平面。这使其适用于过程控制或激光加工过程中工件位置和方向的检测。

### Camera Adapter

The camera adapter enables process observation of a galvanometer scan head's working plane via a camera. This makes it suitable for process control or detection of workpiece positions and orientations during laser processing.



### 0.5mm 厚度高温共烧陶瓷 (HTCC)

0.5mm thickness high temperature co-fired ceramics (HTCC)

## 合作客户(部分)

PARTS OF CUSTOMERS



感谢以上客户长期以来  
对三克激光的惠顾与支持!

Sincerely thanks to customers  
above for their supports for a long time!