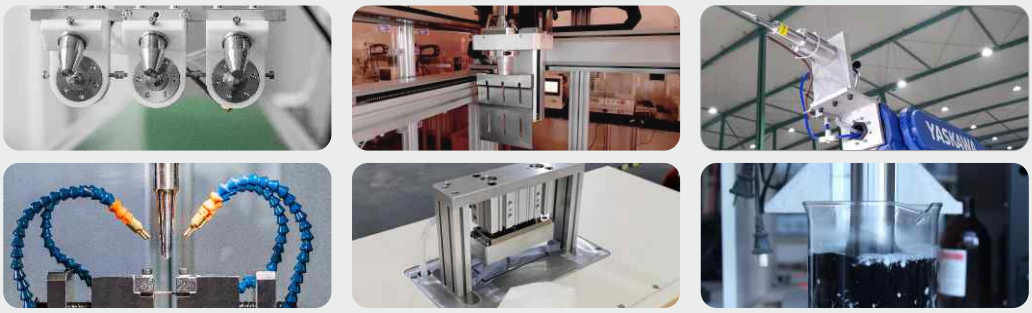
ULTRASONIC

Innovative precision ultrasound service
Manufacturing power

> 创新精准超声 服务制造强国 <



HC SONIC

杭州嘉振超声波科技有限公司
Hangzhou Jiazhen Ultrasonic Technology Co.,Ltd.

创新精准超声 服务制造强国

Innovative precision ultrasound service
Manufacturing power

公司简介
COMPANY INTRODUCTION

杭州嘉振超声波科技有限公司是一家以研发、生产和销售大功率超声波核心部件及成套应用设备的国家高新技术企业。公司注册商标：“杭超”“HC SONIC”。

杭州嘉振超声波科技有限公司以“创新精准超声，服务制造强国”为发展愿景，秉承“以客户需求为中心，以设备品质为核心”的经营理念，坚持走自主研发创新的道路。通过与多所高校的深度校企合作，公司已获得多项发明及实用新型专利，同时不断推出国内外领先的大功率超声波技术产品，为各类科研单位和企业提供超声波应用方面完整的解决方案。

Hangzhou Jiazhen Ultrasonic Technology Co., Ltd. is a national high-tech enterprise that develops, produces and sells high-power ultrasonic core components and complete sets of application equipment. Company registered trademark: "Hangchao"

Hangzhou Jiazhen Ultrasonic Technology Co., Ltd. adheres to the development vision of "innovating and precise ultrasound, serving and manufacturing a strong country", adhering to the business philosophy of "customer demand as the center, equipment quality as the core", and insisting on the road of independent research and development and innovation. Through in-depth school-enterprise cooperation with many universities, the company has obtained a number of inventions and utility model patents. At the same time, it continues to introduce domestic and foreign leading high-power ultrasonic technology products to provide various scientific research institutions and enterprises with complete solutions for ultrasonic applications.

超声波换能器
Ultrasonic transducer

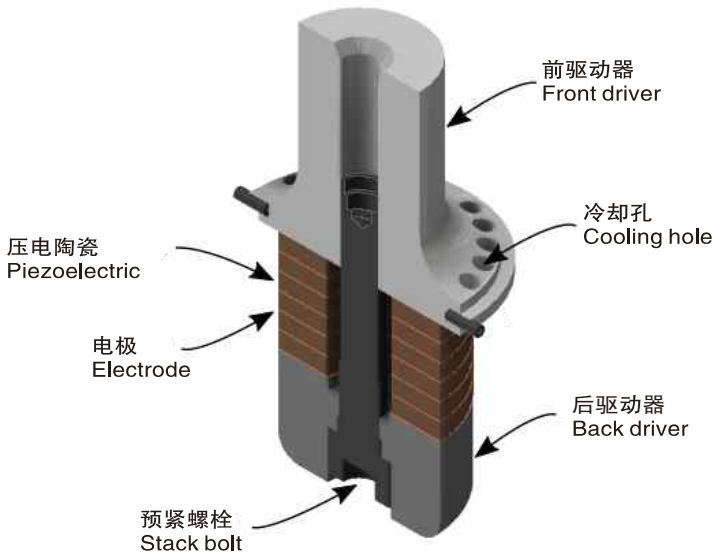
超声波换能器是一种能量转换器件，它的功能是将输入的电功率转换成机械功率（即超声波）再传递出去，而它自身只消耗很小的功率。

Ultrasonic transducer is an energy conversion device, its function is to convert the input electric power into mechanical power (ie ultrasonic) and then transmit it, while it consumes very little power.

超声波发生器将220V的市电转换为高频电流传递给压电陶瓷，谐振于超声频率的压电陶瓷，由材料的压电效应将电信号转换为线性的机械振动，再通过超声波变幅杆放大（减小）振幅，最终传送到工具头进行工作。超声波换能器一般有磁致伸缩式和压电陶瓷两种形式，我们公司采用所有换能器均为压电陶瓷。

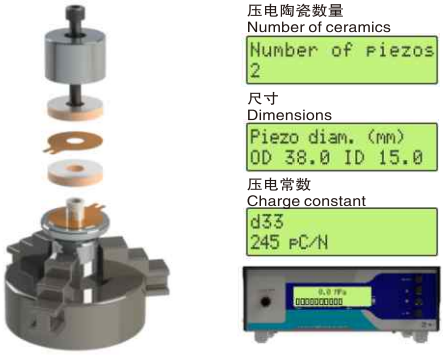
The ultrasonic generator converts the 110VAC or 220VAC electrical supply current into high-frequency current and transmits it to piezoelectric ceramics. The piezoelectric ceramics resonate at the ultrasonic frequency. The piezoelectric effect of the material converts the electrical signal into linear mechanical vibration and then passes through the ultrasonic horn amplify (reduce) the amplitude, and finally transfer to the tool head to work. Ultrasonic transducers generally come in two forms: magnetostrictive and piezoelectric ceramics. Our company uses piezoelectric ceramics for all transducers.

超声波换能器的组成
Composition of ultrasonic trandsducer

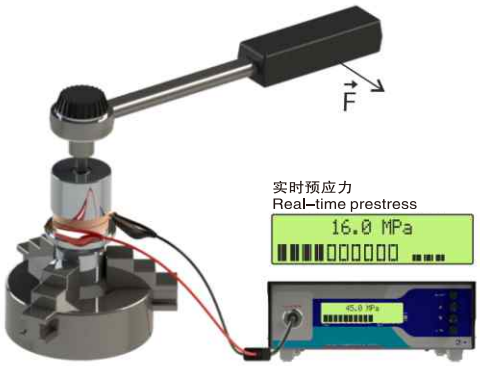


HCSONIC换能器制作
Trandsducer production from HCSONIC

❶ 使用压电钳位组装换超声波
Assemble the transducer and configure the PiezoClamping



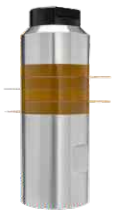
❷ 拧紧中心螺杆直至达到所需的预应力
Tighten until you reach the desired prestress (full bargraph)



产品介绍 Product introduction

我们可以根据客户的需求定制各类不同频率的换能器，频率范围从15KHZ~120KHZ，分别用于焊接、切割、雾化喷涂、声化学液体处理等方面。

We can customize various types of transducers with different frequencies according to the needs of customers. The frequency range is from 15khz to 120Khz. They are used for welding, cutting, atomizing spraying, and sonochemical liquid treatment.


15K


20K


28K


30K


35K


40K

HCSONIC换能器制作工艺

Transducer manufacturing process from HCSONIC

超声波换能器的阀体均采用航空铝材，中心螺杆采用12.9级的高强度钢。

The body of the ultrasonic transducer is made of aviation aluminum, and the center screw is made of high–strength steel of grade 12.9.

换能器工作电压非常高，换能器连接线均采用高温、高压连接线。

The working voltage of the transducer is very high, so the connecting wires of the transducer are all high–temperature and high–voltage connecting wires.

超声波换能器的阀体阀盖以及电极片都进行长时间的抛光处理，螺杆以及各个连接部件都采用超 声波清洗，使各部件结合更加紧密，减少发热（能量损耗）降低阻抗。

The body cover and electrode plate of the ultrasonic transducer are polished for a long time, and the screw and each connecting part are cleaned by ultrasonic wave, so that the parts are tightly combined, reducing heat (energy loss) and reducing impedance.

超声波换能器选用国内外优质陶瓷片，成品阻抗低，品质因素高。

The ultrasonic transducer is made of high–quality ceramic chips at home and abroad. The finished product has low impedance and high quality factor.

传统的换能器制作通过扭力扳手来确定预应力，这种方式由于清洗、润滑程度的不同数值会很大偏移 ，过大以及过小的预应力会导致压电陶瓷片晶裂、阻抗增加发热严重、大大缩短了换能器的使用寿命 。HCSONIC制作时采用电荷、电压检测时的预应力，确保换能器获得精准的预应力。

所有换能器都进行长时间的老换测试，出厂前进行质检并进行48小时的通电测试，确保稳定工作后再 进行发货。

The traditional transducer is manufactured by using a torque wrench to determine the prestress. In this way, due to the different values of cleaning and lubrication, there will be a large deviation. Excessive and too small prestress will cause piezoelectric ceramic chip cracks. The increase in impedance causes severe heat generation and greatly shortens the service life of the transducer. HCSONIC uses pre–stress during charge and voltage detection to ensure that the transducer obtains accurate pre–stress.

All transducers are subjected to long–term aging test, quality inspection and 48–hour power–on test before shipping to ensure stable operation before delivery.

超声波发生器

The ultrasonic generator

超声波发生器具有较高的带宽，焊接部件由于磨损发热以及其他因素导致小范围频率偏移，也能保证 焊接机正常工作。

The ultrasonic generator has a high bandwidth, and the welding parts have a small frequency deviation due to wear, heat and other factors, which can also ensure the normal operation of the welding machine.

超声波发生器出厂时都是按照容量来匹配换能器。如果换能器容量不在匹配范围，会导致设备工作不 正常，HCSONIC 20K发生器有较宽的电容匹配范围（11000–13000PF）。

Ultrasonic generators are factory–matched with transducers according to capacity. If the transducer capacity is not within the matching range, it will cause the device to work abnormally, and the HCSONIC 20K generator has a wide capacitance matching range (11000–13000PF).

产品特征 Product features

- **锁定主共振：**所有的超声波系统都有一个主共振(理想的工作共振)，此外，还会有二次(虚假的)共振 。当电源启动时，HCSONIC超声波发生器会锁定主共振而忽略次级共振。

  Lock the main resonance: All ultrasonic systems have a main resonance (ideal working resonance), in addition, there will be a second (false) resonance. When the power is turned on, the HCSONIC ultrasonic generator will lock the primary resonance and ignore the secondary resonance.

- **跟踪主共振：**在超声操作过程中，主共振的频率可能会发生偏移。随着电池堆温度的升高，该频率可 能会降低（由于内部损耗或负载传递的热量），超声波发生器能够自动地跟踪该频移，继续稳定工作 。

  Tracking the main resonance: During ultrasonic operation, the frequency of the main resonance may shift. As the temperature of the battery stack increases, the frequency may decrease (due to internal losses or heat transferred by the load), and the ultrasonic generator can automatically track the frequency shift and continue to work stably

- **自动调整幅度：**HCSONIC超声波发生器可以通过控制输出振幅来实现最佳控制，焊接焊接物的厚薄进行调节，保证同一焊接可以焊接普通医用口罩以及KN95专业口罩。

  Automatic amplitude adjustment: The HCSONIC ultrasonic generator can achieve the best control by controlling the output amplitude, and the thickness of the welding materials can be adjusted to ensure that the same welding can weld ordinary medical masks and KN95 professional masks.

多功能超声波疲劳试验系统
Multifunctional Ultrasonic Fatigue Test System

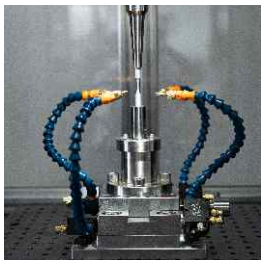
以 10^9 疲劳试验为例
Take 10^9 fatigue test as an example

- 20Hz伺服液压疲劳试验需要 1.5 年
  The 20Hz servo hydraulic fatigue test takes 1.5 years
- 50Hz旋转弯曲试验机需要 231 天
  The 50Hz rotary bending machine takes 231 days
- 300Hz高频振动台需要 38.5 天
  The 300Hz high frequency vibrator takes 38.5 days
- 20KHz超声疲劳实验仅需 13.8 小时
  The 20Khz ultrasonic fatigue test takes 13.8 hours only

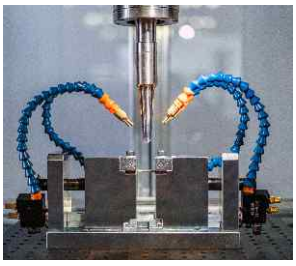
超声超高周疲劳试验技术是解决航空发动机叶片结构等超长疲劳寿命研究的唯一可行方法

High Cycle Fatigue Strength Ultrasonic Testing technology is the only feasible method to solve the research of aero-engine blade structure and other fatigue and long using life material

轴向对称拉压疲劳试验
Axial symmetric tension compression fatigue test



可调应力比轴向拉压疲劳试验
Axial tension compression fatigue test with adjustable stress ratio

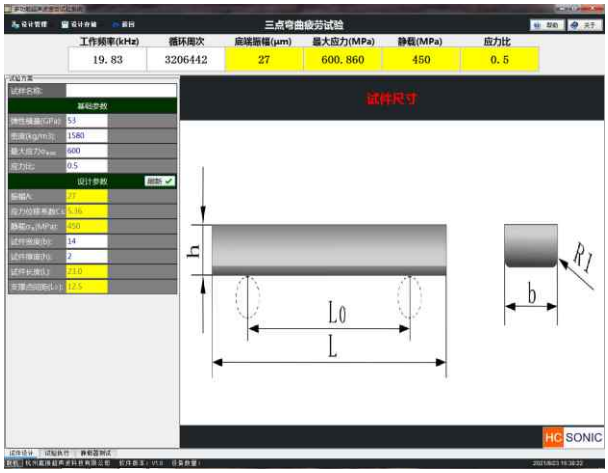


三点弯曲疲劳试验
Three point bending fatigue test

振动弯曲疲劳试验
Vibration bending fatigue test

控制系统是超声波疲劳试验系统的主要软件部分，包括：高精度机电耦合激振控制、疲劳试验过程监控和试样辅助设计，试验远程监控等四部分组成。 该系统具有间歇加载功能，可按程序设定连续和间断加载试验，以及间断时间；间断加载应有防止启动功率过大对试样产生损伤的功能；可实现对加载的控制，用户可依据试验方案输入载荷；可设定工作频率范围，超出范围时设备停止工作，并在界面上显 示提示信息；具有试件辅助设计功能，用于试验前，根据试验目的、材料参数等辅助用户设计试件；软件能够显示超声发生器工作的频率和名义位移数据，可实现超声振动变载输出功能。

The control system is the main software part of the ultrasonic fatigue test system, including four parts: high-precision electromechanical coupling excitation control, fatigue test process monitoring, sample aided design, test remote monitoring and so on. The system has the function of intermittent loading, and can set the continuous and intermittent loading test and intermittent time according to the program; Intermittent loading shall have the function of preventing damage to the sample caused by excessive starting power; The loading can be controlled, and the user can input the load according to the test scheme; The working frequency range can be set. When it exceeds the range, the equipment stops working and a prompt message is displayed on the interface; It has the function of specimen aided design, which is used to assist the user to design the specimen according to the test purpose and material parameters before the test; The software can display the working frequency and nominal displacement data of the ultrasonic generator, and realize the variable load output function of ultrasonic vibration.



超声波立式桌面喷涂设备

Ultrasonic vertical desktop spraying equipment

雾化颗粒更均匀/更薄/更可控

Atomized particles are more uniform / thinner / more controllable

抗腐蚀/无噪音/不堵塞

Corrosion resistant / no noise / no blockage

涂层厚度控制精度高

High precision control of coating thickness

4倍的原料利用率

4 times the utilization of raw materials

产品特征 Product features

超声波精密喷涂机，采用发明专利的超声波喷头技术，可提供均匀高效的薄膜喷涂及喷雾热解，膜厚最薄可达几十纳米。适用于薄膜太阳能电池、燃料电池、半导体光刻胶、传感器、PCB助焊剂、织物功能涂层、玻璃镀膜等多种纳米及亚微米级薄膜制备。

HC-LA5001GL作为纳米薄膜精密喷涂机， 适合于研发科研使用，可适用全系列超声波喷头，用于小面积或中等面积的薄膜制备。集合超声波、载气、液体、加热台、真空吸附、尾气排放等多系统控制于一体。

Ultrasonic precision spraying machine, using the invention of the ultrasonic spray nozzle technology, can provide uniform and efficient film spraying and spray pyrolysis, the thickness of the film is thinner to dozens of nanometer. It is suitable for the preparation of nano and submicron films such as thin film solar cells, fuel cells, semiconductor photoresists, sensors, PCB flux, fabric functional coating, glass coating and so on.As a nano film precision spraying machine, HC-LA5001GL is suitable for R & D and scientific research. It can be applied to a full range of ultrasonic nozzles for film preparation in small or medium areas. It integrates ultrasonic, carrier gas, liquid, heating table, vacuum adsorption, tail gas emission and other system controls.

参数 Parameter

立式喷涂设备	(Vertical spraying equipment)
超声波精密喷头: 嘉振超声专利技术超声喷头（可选配多种喷头）	(Ultrasonic precision nozzle:Jiazhen ultrasonic patented technology ultrasonic nozzle (multiple nozzles can be selected)
全数字超声波控制器: 超声功率控制精度达 0.01W	(Full digital ultrasonic controller:The ultrasonic power control accuracy is up to 0.01W)
喷涂均匀度：<5%	(Spraying uniformity:<5%)
喷涂液体粘度：<30cps	(Viscosity of spraying liquid:<30cps)
干膜厚度在20纳米至 100微米范围内可控（视材料而定）	(The dry film thickness is controllable in the range of 20 nm to 100 microns (depending onMaterial dependent))
涂料转换效率： >95%	(Coating conversion efficiency: >95%)
XYZ三轴运动系统	(XYZ three axis motion system)
最大喷涂面积：550mm x 550mm	(Maximum spraying area:550mm x 550mm)
双通道循环注射泵	(Dual channel circulating syringe pump)
内置排风系统	(Built in exhaust system)
激光对位：快速对位喷涂位置	(Laser alignment: quickly align the spraying position)
真空吸附加热台（选配）	(Vacuum adsorption heating table (optional))
超声波分散供液，防止悬浮液团聚（选配）	(Ultrasonic dispersion for liquid supply to prevent suspension agglomeration (optional))
可选配加热基板，实现在线热解喷涂（选配）	(Optional heating substrate to realize on-line pyrolysis spraying (optional))

超声波桌面型雾化喷涂设备

Ultrasonic desktop atomization spraying equipment

HC-LA5001GL作为纳米薄膜精密喷涂机， 适合于研发科研使用，可适用全系列超声波喷头，用于小面积或中等面积的薄膜制备。 集合超声波、载气、液体、加热台、真空吸附、尾气排放等多系统控制于一体。

As a nano film precision spraying machine,HC-LA5001GL is suitable for R & D and scientific research. It can be applied to a full range of ultrasonic nozzles for film preparation in small or medium areas. It integrates ultrasonic, carrier gas, liquid, heating table, vacuum adsorption, tail gas emission and other system controls.

参数 Parameter

台式喷涂设备	(Desktop spraying equipment)
超声波精密喷头: 嘉振超声专利技术超声喷头（可选配多种喷头）	(Ultrasonic precision nozzle:Jiazhen ultrasonic patented technology ultrasonic nozzle (multiple nozzles can be selected)
全数字超声波控制器: 超声功率控制精度达 0.01W	(Full digital ultrasonic controller:The ultrasonic power control accuracy is up to 0.01W)
喷涂均匀度：<5%	(Spraying uniformity:<5%)
喷涂液体粘度：<30cps	(Viscosity of spraying liquid:<30cps)
干膜厚度在20纳米至 100微米范围内可控（视材料而定）	(The dry film thickness is controllable in the range of 20 nm to 100 microns (depending onMaterial dependent))
涂料转换效率： >95%	(Coating conversion efficiency: >95%)
XYZ三轴运动系统	(XYZ three axis motion system)
最大喷涂面积：250mm x 250mm	(Maximum spraying area:250mm x 250mm)
单通道实验室注射泵	(Single channel laboratory syringe pump)
内置排风系统	(Built in exhaust system)
激光对位：快速对位喷涂位置	(Laser alignment: quickly align the spraying position)
真空吸附加热台（选配）	(Vacuum adsorption heating table (optional))
超声波分散供液，防止悬浮液团聚（选配）	(Ultrasonic dispersion for liquid supply to prevent suspension agglomeration (optional))
可选配加热基板，实现在线热解喷涂（选配）	(Optional heating substrate to realize on-line pyrolysis spraying (optional))

超声波心脏血管支架喷涂设备

Ultrasonic cardiac vascular stent spraying equipment

产品特征 Product features

- 血管支架喷涂：集成超声波喷头、超声控制、液体输送、支架装卸及运动等系统。
  Vascular stent spraying: integrated ultrasonic nozzle, ultrasonic control, liquid delivery, stent loading and unloading and movement systems.
- 超声波精密喷头：嘉振超声微细型和聚拢型超声波喷头，可极低流量稳恒工作。
  Ultrasonic precision nozzle: Jiazhen ultrasonic micro and converging ultrasonic nozzle can work stably with very low flow.
- 喷涂幅宽：1mm–10mm，可适应多种规格支架，精确控制支架载药量，一致性高。
  Spraying width: 1mm–10mm, which can adapt to various specifications of supports, accurately control the drug loading of supports, and has high consistency.
- 节省原料：原料利用率高达85%以上，4倍于传统二流体喷涂药物涂料转换效率高于气压喷涂4–5倍。
  Save raw materials: the utilization rate of raw materials is more than 85%, which is 4 times higher than that of traditional two fluid spraying, and the conversion efficiency of drug coating is 4–5 times higher than that of pneumatic spraying.
- 独特支架夹具设计：可快速装卸支架。
  Unique support fixture design: it can quickly load and unload the support.

超声波联排雾化喷涂设备

Ultrasonic combined row atomization spraying equipment

传送式自动超声波精密喷涂机可以应用于各种纳米及亚微米级功能性涂层薄膜的研发及生产，如：新能源领域的质子交换膜燃料电池膜电极喷涂、薄膜太阳能电池喷涂，如钙钛矿太阳能电池、有机太阳能电池、透明导电薄膜等；生物医疗领域的生物传感器涂层喷涂，微电子及半导体领域的晶圆硅片光刻胶喷涂、电路板助焊剂喷涂，玻璃镀膜领域的AR增透减反射膜喷涂、亲水涂层喷涂、疏水涂层喷涂、隔热膜喷涂、透明导电薄膜喷涂等，无纺布及纺织品领域的超疏水涂层喷涂、抗菌涂层喷涂等等。

The transmission automatic ultrasonic precision spraying machine can be applied to the R & D and production of various nano and submicron functional coating films, such as proton exchange membrane fuel cell membrane electrode spraying and thin film solar cell spraying in the field of new energy, such as perovskite solar cells, organic solar cells, transparent conductive films, etc; Biosensor coating spraying in the field of biomedicine, wafer photoresist spraying and circuit board flux spraying in the field of microelectronics and semiconductors, AR antireflection and antireflection film spraying, hydrophilic coating spraying, hydrophobic coating spraying, thermal insulation film spraying, transparent conductive film spraying in the field of glass coating, superhydrophobic coating spraying in the field of non-woven fabrics and textiles Antibacterial coating spraying, etc.

产品特征 Product features

传送式自动超声波精密喷涂机，一种量产型自动超声波喷涂设备，可配备宽喷型超声波喷头，并可以同时搭载多个喷头并联工作，配备的自动传送机可对样品进行自动传送。自动化超声波喷涂设备，采用超声波喷头技术，可提供均匀高效的薄膜喷涂，膜厚最薄可达几十纳米。

The utility model relates to a conveying automatic ultrasonic precision spraying machine, which is a mass-produced automatic ultrasonic spraying equipment. It can be equipped with a wide spraying ultrasonic nozzle, and can be equipped with multiple nozzles in parallel. The equipped automatic conveyor can automatically transmit samples. Automatic ultrasonic spraying equipment adopts ultrasonic nozzle technology, which can provide uniform and efficient film spraying, and the thinnest film thickness can reach tens of nanometers.

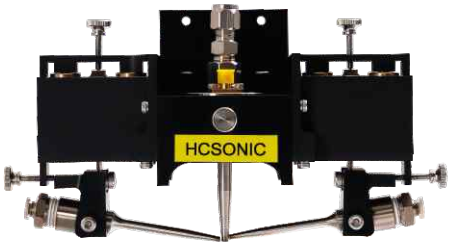
- 涂层厚度控制精度高：可制备20纳米到数十微米的涂层，精确控制涂层厚度 （High precision of coating thickness control: 20 nm to tens of microns can be prepared to accurately control the coating thickness）
- 喷涂均匀度：>95% （Spraying uniformity: > 95%）
- 节省原料：原料利用率高达85%以上，4倍于传统二流体喷涂 （Save raw materials: the utilization rate of raw materials is more than 85%, 4 times higher than that of traditional two fluid spraying）
- XYZ三轴可编程运动系统 （XYZ three axis motion system）
- 触摸屏控制系统 （Touch screen control system）

外型结构的独特设计
Unique design of the exterior structure

通过不同的频率和气流通道设计可制造不同的雾化颗粒大小及喷涂宽幅，以适应不同的面积、厚度、光洁度等喷涂要求。

Different atomic particle sizes and spray widths can be manufactured through different frequency and airflow channel designs to suit different area, thickness, finish and other spray requirements.

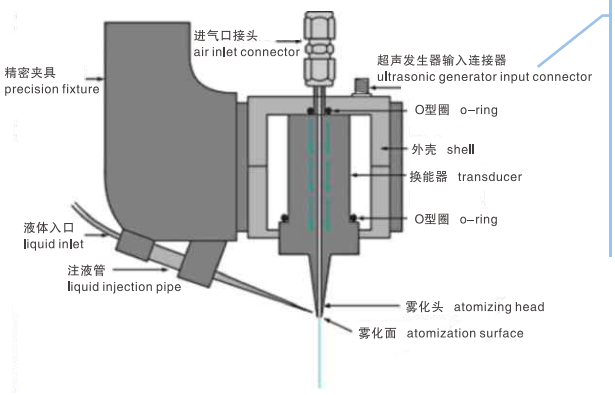
超声波微细喷雾系统 Ultrasonic micro spray system



- 用于扇形面积喷涂 (For sector area spraying)
- 频率范围: 30–120KHZ (Frequency range)
- 雾化颗粒大小: 15–40μm (Atomized particle size range)
- 喷雾流量: 0.001–1ml/min (Spray flow)
- 液体粘度: <30cps (Liquid viscosity)
- 喷涂高度: 5–30mm (Spray height)
- 喷涂宽度: 0.5–3mm (Spray width)
- 导流气压: <0.01Mpa (Diversion pressure)
- 工作温度: 20–80℃ (Working temperature)

微细喷雾系统结合了HCSONIC聚焦式超声波喷嘴，多通道注液管及低压导向载气，多项结合产生一束轻柔、高度聚焦性的雾束。

The micro spray system combines HCSONIC focused ultrasonic nozzle, multi–channel liquid injection tube and low pressure guided carrier gas, and a combination of light and highly focused fog bundles is generated.

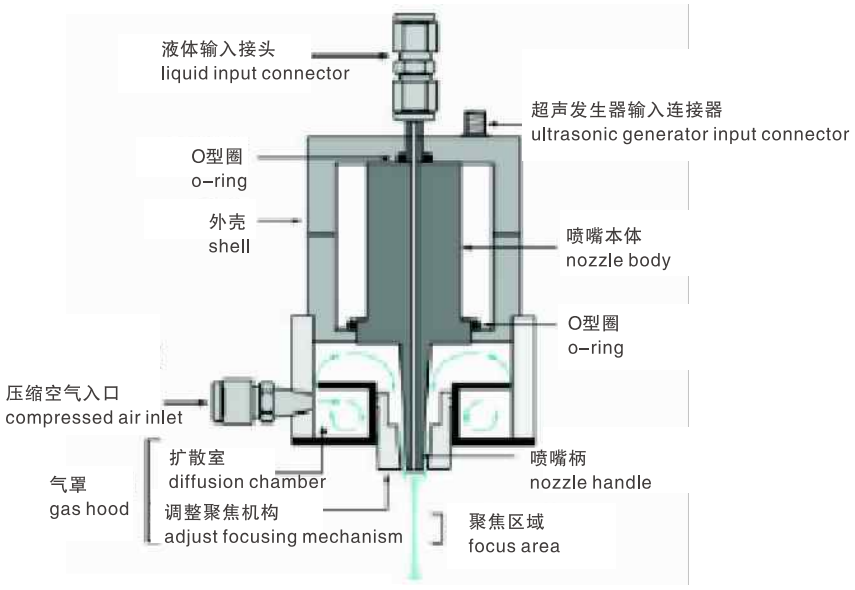


产品结构 Product mix

超声波准确喷雾系统 Ultrasonic accurate spray system

- 用于小面积喷涂 (For small area spraying)
- 频率范围: 30–120KHZ (Frequency range)
- 雾化颗粒大小: 14–40μm (Atomized particle size range)
- 喷雾流量: 0.001–5ml/min (Spray flow)
- 液体粘度: <30cps (Liquid viscosity)
- 喷涂高度: 10–30mm (Spray height)
- 喷涂宽度: 1–3mm (Spray width)
- 导流气压: <0.02Mpa (Diversion pressure)
- 工作温度: 20–80℃ (Working temperature)

产品结构 Product mix



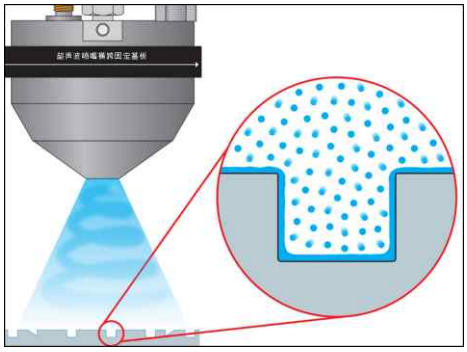
准确喷雾系统结合了低压气体及HCSONIC独特微雾化超声波喷头，能产生轻柔且高度聚焦性雾束。当压缩的气体被引入气罩内的空气扩散室，能产生出一致且均布的气流环绕在喷嘴的表面。由超声产生的喷雾会立即形成喷雾流。气体罩上有一个可调整的调焦装置，该装置对喷雾宽度实施完全控制。

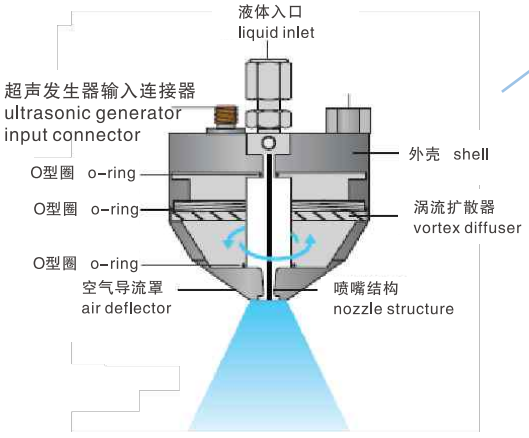
The accurate spray system combines low pressure gas and HCSONIC unique micro atomizing ultrasonic nozzle, which can produce light and highly focused fog. When The accurate spray system combines low pressure gas and HCSONIC unique micro atomizing ultrasonic nozzle, which can produce light and highly focused fog. When the compressed gas is introduced into the air diffusion chamber in the hood, a uniform and evenly distributed air flow can be generated around the surface of the nozzle. Spray generated by ultrasound will form spray flow immediately. There is an adjustable focusing device on the hood, which controls the spray width completely.

超声波漩涡喷涂系统 Ultrasonic vortex spraying system

- 用于大面积喷涂 (For large area spraying)
- 频率范围: 30–120KHZ (Frequency range)
- 雾化颗粒大小: 5–60μm (Atomized particle size range)
- 喷雾流量: 5–60ml/min (Spray flow)
- 液体粘度: <50cps (Liquid viscosity)
- 喷涂高度: 30–80mm (Spray height)
- 喷涂宽度: 5–60mm (Spray width)
- 导流气压: <0.1Mpa (Diversion pressure)
- 工作温度: 20–80℃ (Working temperature)

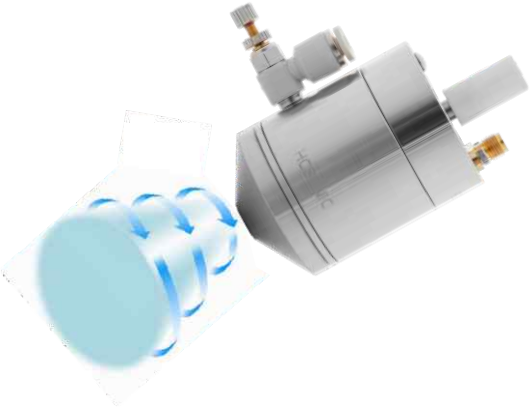
产品结构 Product mix





涡旋喷嘴是一种用于涂覆沟槽的超声波喷嘴，其旋转涂层过程无法达到均匀覆盖。雾化液滴具有极少的动能——低速涡流空气给出的能量，刚好满足水滴外向动能，使其在表面均匀沉降。

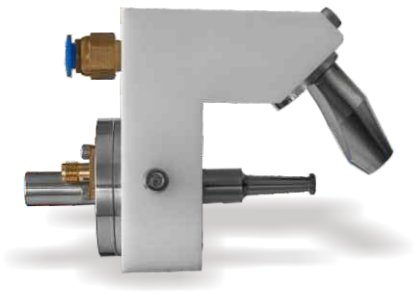
The swirl spray system utilizes HCSONIC's unique cavity design and uses a fast rotating air flow to produce a wider and stable spray beam.By adjusting the distance between the atomizing head and the workpiece, the conical spray beam with adjustable diameter can be generated by the swirl nozzle.



旋涡喷涂系统利用HCSONIC独特腔体设计，利用快速的旋转气流，可产生较阔且稳定的喷雾束。通过调整雾化头与工件的距离，旋涡喷嘴可产生可调直径之圆锥形喷雾束。

The swirl spray system utilizes HCSONIC's unique cavity design and uses a fast rotating air flow to produce a wider and stable spray beam. By adjusting the distance between the atomizing head and the workpiece, the conical spray beam with adjustable diameter can be generated by the swirl nozzle.

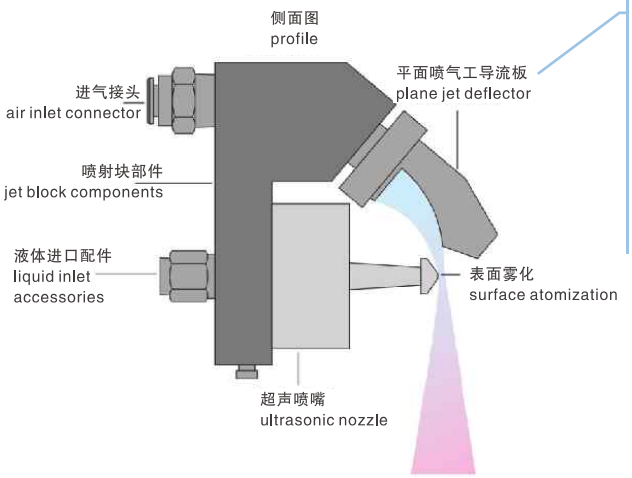
超声波扇形喷雾系统 Ultrasonic sector spray system



- 用于扇形面积喷涂 (For sector area spraying)
- 频率范围: 30–120KHZ (Frequency range)
- 雾化颗粒大小: 15–40μm (Atomized particle size range)
- 喷雾流量: 0.1–20ml/min (Spray flow)
- 液体粘度: <20cps (Liquid viscosity)
- 喷涂高度: 50–150mm (Spray height)
- 喷涂宽度: 20–100mm (Spray width)
- 导流气压: <0.05Mpa (Diversion pressure)
- 工作温度: 20–80℃ (Working temperature)

产品结构 Product mix

扇形喷涂系统是将HCSONIC独特的超声波雾化喷头与扇形喷嘴所喷出之受控气流结合而成。在雾化面上由超声波所产生之雾滴会立即被气流所带走，形成扇形的喷雾形状。由于气流流速受到控制，所以气流能以高或低撞击力将喷雾射向产品或工件上。



The fan–shaped spraying system is composed of hcsonic's unique ultrasonic atomizing nozzle and the controlled air flow ejected by the fan–shaped nozzle. Droplets generated by ultrasonic waves on the atomized surface are immediately taken away by the airstream, forming fan–shaped spray shapes. Because the airflow velocity is controlled, the airstream can shoot the spray onto the product or workpiece with high or low impact force.

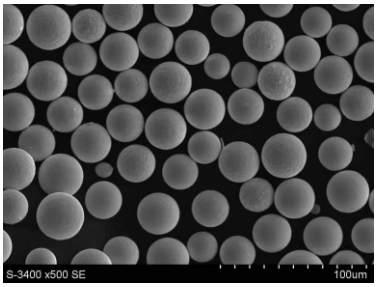
宽嘴型 Wide spray type

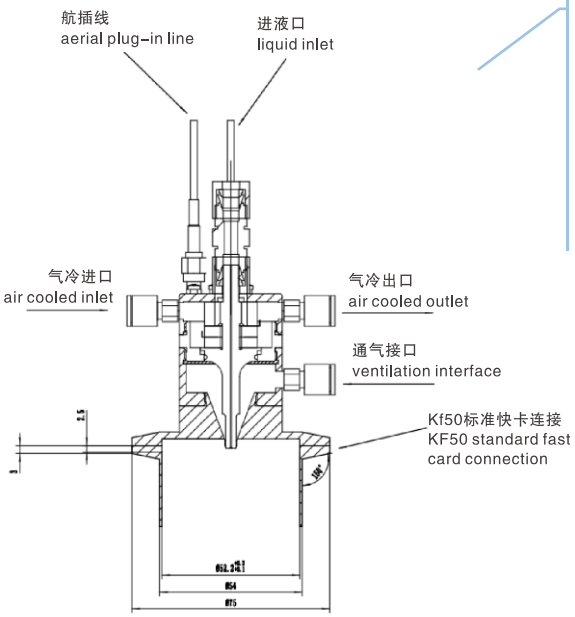
- 用于扇形面积喷涂 (For sector area spraying)
- 频率范围: 30–120KHZ (Frequency range)
- 雾化颗粒大小: 15–40μm (Atomized particle size range)
- 喷雾流量: 0.1–20ml/min (Spray flow)
- 液体粘度: <30cps (Liquid viscosity)
- 喷涂高度: 10–20mm (Spray height)
- 喷涂宽度: 3–10mm (Spray width)
- 导流气压: <0.01Mpa (Diversion pressure)
- 工作温度: 20–80℃ (Working temperature)

超声波高温热解喷涂系统 Ultrasonic high temperature pyrolysis spraying system

- 用于大面积喷涂 (For large area spraying)
- 频率范围: 30–120KHZ (Frequency range)
- 雾化颗粒大小: 5–60μm (Atomized particle size range)
- 喷雾流量: 5–60ml/min (Spray flow)
- 液体粘度: <50cps (Liquid viscosity)
- 喷涂高度: 30–80mm (Spray height)
- 喷涂宽度: 5–60mm (Spray width)
- 导流气压: <0.1Mpa (Diversion pressure)
- 工作温度: 20–80℃ (Working temperature)

产品结构 Product mix





探入型 Penetration type

- 用于高温环境喷涂 (For high temperature environment spraying)
- 频率范围: 30–120KHZ (Frequency range)
- 雾化颗粒大小: 25–50μm (Atomized particle size range)
- 喷雾流量: 0.1–20ml/min (Spray flow)
- 液体粘度: <30cps (Liquid viscosity)
- 喷涂高度: 10–20mm (Spray height)
- 喷涂宽度: 3–10mm (Spray width)
- 导流气压: <0.01Mpa (Diversion pressure)
- 工作温度: 20–80℃ (Working temperature)

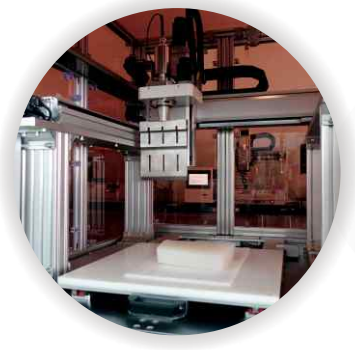
超声波龙门式自动切割平台
Ultrasonic Gantry Automatic Cutting Platform

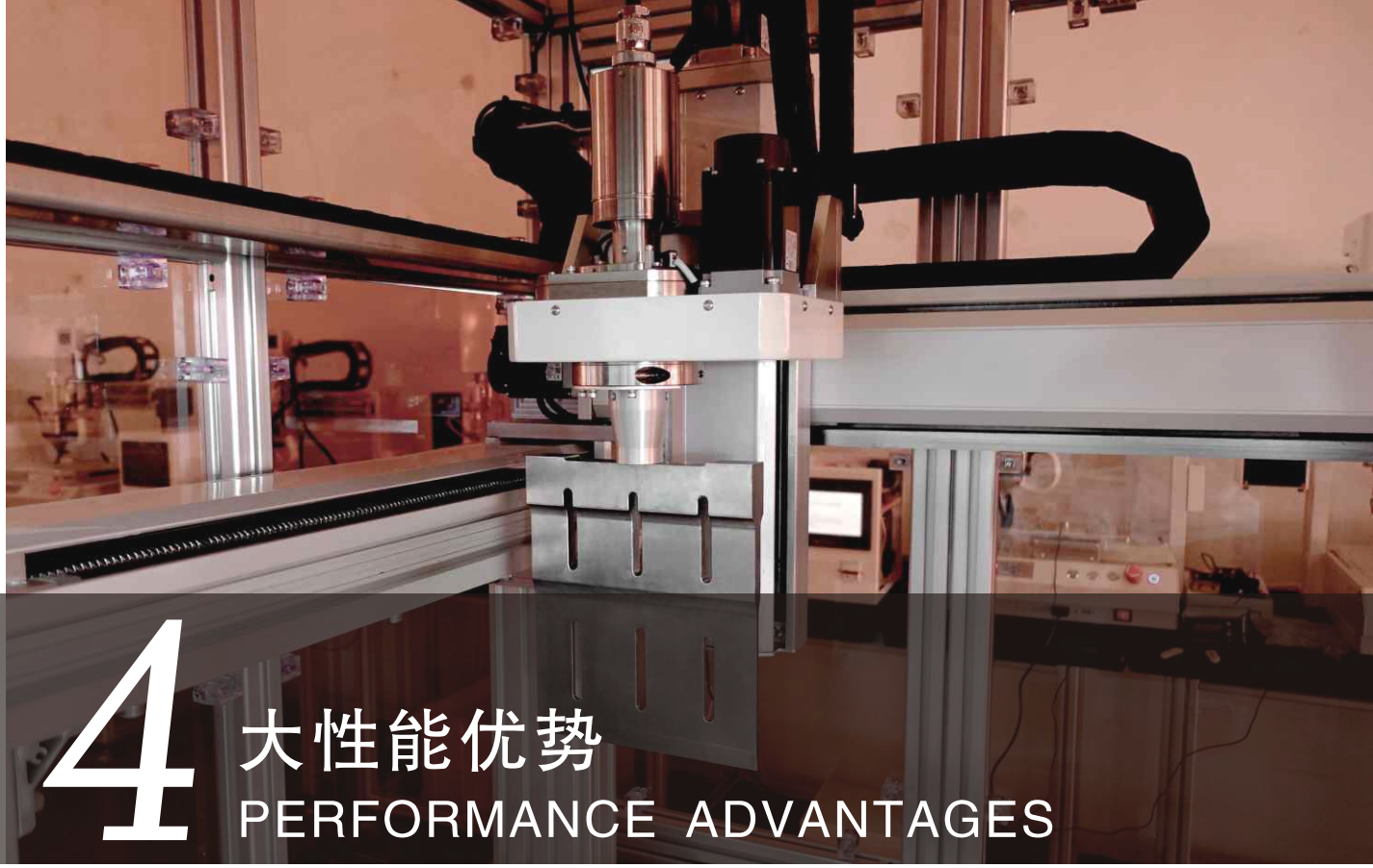
超声波切割是利用超声波的能量，将被切割材料的局部加热熔化，达到切割材料的目的，因此无需锋利的刃口。

超声波切割刀可用于切割热塑性树脂板、片材、薄膜和层压材料，碳纤维复合材料，聚乙烯纤维、含碳或玻璃纤维（GFRP）的成型制品，橡胶、硫化胶乳、非硫化胶乳和食品等。

Ultrasonic cutting use the energy of ultrasound to melt the cutting material by local heating, so as to achieve the purpose of cutting material, so there is no need for sharp edges.

Ultrasonic cutter can be used to cut thermoplastic resin sheets, sheets, fi lms and laminates, carbon fiber composites, polyethylene fibers, carbon or glass fibers (GFRP) moulded products, rubber, vulcanized latex, non–vulcanized latex ,cake, cookies, Frozen food, frozen meat, sandwich and some other food, etc.





4 大性能优势
PERFORMANCE ADVANTAGES

> 稳定性高
High stability

超声发生器工作时产生电磁振动，并转化为机械振荡传输到切割刀和切割的材料上，机械的进行分切，因此不需要锋利的刃口，刀片磨损较小，刀头可更换，操作简便。

When the ultrasonic generator works, it generates electromagnetic vibration, which is transformed into mechanical oscillation and transmitted to the cutting knife and cutting material. It does not need sharp edges, and the blade wears less. At the same time, the cutting knife can be replaced easy.

> 切割整齐
Cut neatly

由于超声波通过高频振动进行切割，材料不会粘附在刀片表面，切割时只需要较小的压力，对于易碎和柔软材料都不变形和磨损，织物切割同时自动封边，不会引起崩边。

Because ultrasonic cutting is carried out by high–frequency vibration, the material will not adhere to the blade surface, only a small pressure is needed when cutting, and the fragile and soft materials will not be deformed and worn. Fabric cutting and automatic edge sealing will not cause edge collapse.

> 无污染
Pollution–free

超声刀切割时，刀头温度低于50℃，不会产生烟尘和臭味，排除了切割时出现伤害和起火的危险。

When cutting with ultrasonic knife, the temperature of the knife head is lower than 50 C, which will not produce smoke and odor, eliminating the danger of injury and fire during cutting.

> 应用范围广
Wide range of applications

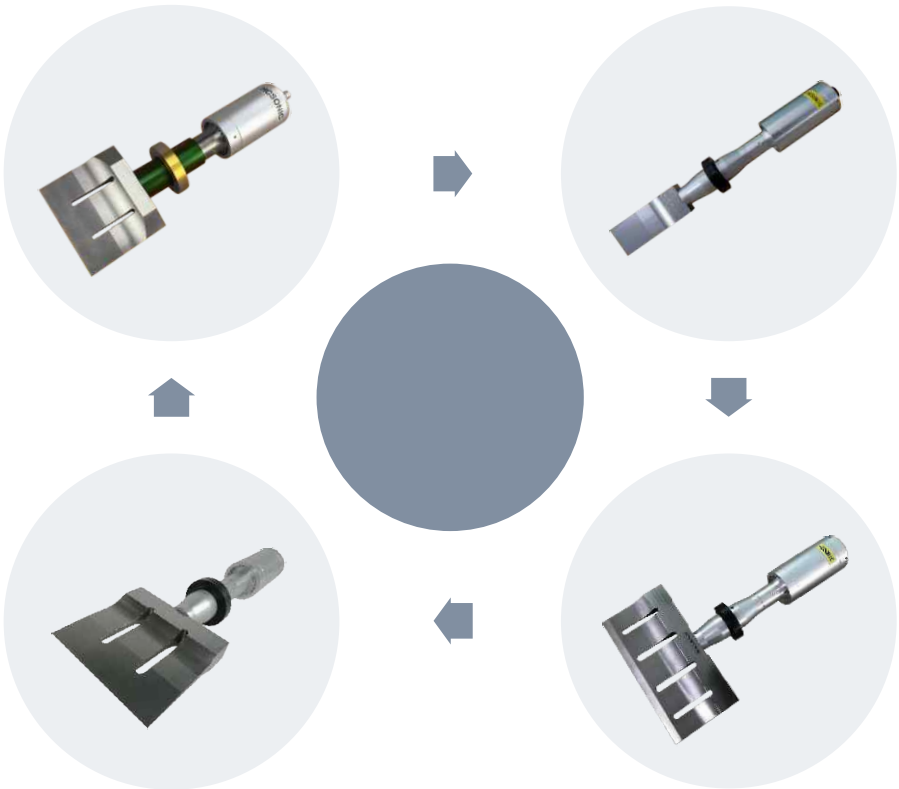
橡胶、硫化胶乳、非硫化胶乳、食品和各种纺织材料、塑料薄片都可被超声波切割。

Rubber, vulcanized latex, non–vulcanized latex, food and various textile materials, plastic sheets can be cut by ultrasonic.

外型结构的独特设计
Unique design of the exterior structure

根据不同的切割材料、切割面积可制造相应的刀头大小及宽度，以满足不同的面积、厚度等切割要求。

According to different cutting materials, cutting areas can be made to the corresponding size and width of the cutting blades, to meet the requirements of different areas, thickness and materials.



技术参数
Technical parameters

使用频率 Frequency	20–40KHZ	功率范围 Power range	50–2000W
运行最大速度 Maximum running speed	900mm/S	定位精度 Positioning accuracy	0.02mm
传动方式 Driving mode	伺服电机+丝杆+直线导轨 Servo Motor+Screw+Linear Guide		
控制方式 Control mode	PLC+触摸屏，具有手动及自动模式，带手柄控制 PLC + touch screen, with manual and automatic mode,handle control		
输入电源 Input power supply	单相 220V 50HZ 15A Single phase 220V 50HZ 15A		
保护装置 Protector	限位保护，电流超载保护，光栅保护，门限保护，轴异常保护 Limit protection, current overload protection, grating protection, threshold protection, shaft abnormal protection		
显示方式 Display mode	7寸触摸人机交互界面 7–inch touch human–computer interaction interface		

超声波多轴切割设备

Ultrasonic Multi–Axis Cutting Equipment

超声波切割近年来在汽车塑料件和橡胶行业获得了广泛应用。超声波切割刀可精确切割汽车塑料水口件、橡胶、热塑性薄膜、各种热熔性材料。其中既包括手持设备，也有集成到自动化机器中的各类系统。超声振动刀的优势在于：切割精确、无压切割（可避免软质切割物变形）、特定材料边缘切割的同时可进行焊接、切割速度快以及可明显降低清洗成本。

In recent years, ultrasonic cutting has been widely used in automotive plastic parts and rubber industry. Ultrasound cutter can precisely cut automotive plastic nozzle parts, rubber, thermoplastic film, all kinds of hot melting materials. It includes not only handheld devices, but also various systems integrated into automated machines. The advantages of ultrasonic vibration cutter are: accurate cutting, non–pressure cutting (which can avoid the deformation of soft cutting), welding while cutting the edges of specific materials, fast cutting speed and obvious reduction of cleaning costs.

外型结构的独特设计
Unique design of the exterior structure

超声波切割刀可用于手持式切割和自动化机械装夹。针对不同的应用环境，HCSONIC可提供20–40KHZ超声波切割刀，刀片可定制。

The ultrasonic cutting knife can be used for hand–held cutting and automatic mechanical clamping. For different application environments, HCSONIC can provide 20–40KHZ ultrasonic cutting knives and blades customizable.

具有可更换的硬质合金切削刀片，可延长刀具寿命
With replaceable carbide cutting blades, tool life can be prolonged.

坚固的一体式工具头刀片结构几乎消除了破损和能量损失
Strong integrated tool head blade structure almost eliminates damage and energy loss

螺纹式可替换刀头
Threaded replaceable tool head

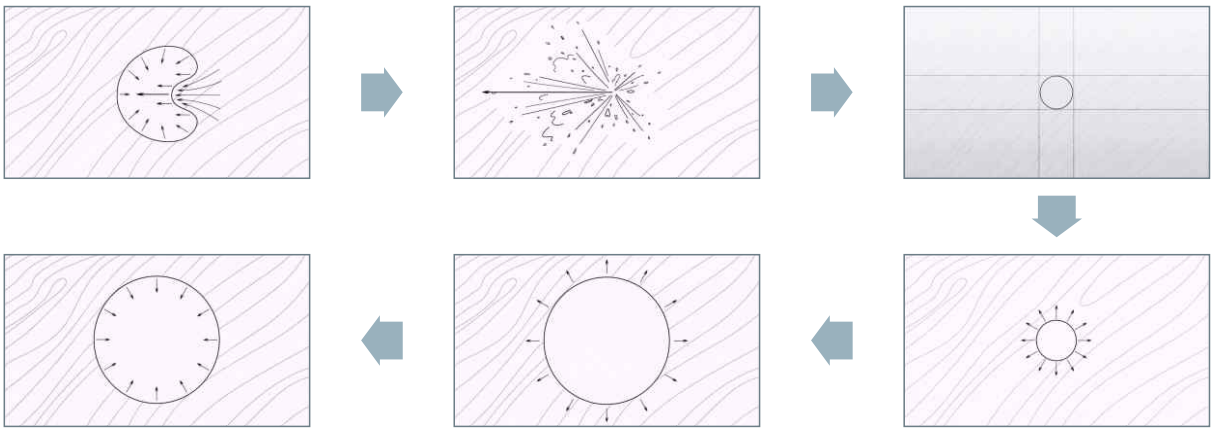
技术参数
Technical parameters

使用频率 Frequency	20–40KHZ	功率范围 Power range	100–2000W
运行最大速度 Maximum running speed	900mm/S	定位精度 Positioning accuracy	0.02mm
传动方式 Driving mode	六轴机械臂 Six–Axis manipulator		
控制方式 Control mode	PLC+触摸屏，具有手动及自动模式，带手柄控制 PLC + touch screen, with manual and automatic mode,handle control		
输入电源 Input power supply	单相 220V 50HZ 15A Single phase 220V 50HZ 15A		
保护装置 Protector	限位保护，电流超载保护，光栅保护，门限保护，轴异常保护 Limit protection, current overload protection, grating protection, threshold protection, shaft abnormal protection		
显示方式 Display mode	7寸触摸人机交互界面 7–inch touch human–computer interaction interface		

超声波分散设备
Ultrasonic Dispersion Equipment

当以高强度超声处理液体时，传播到液体介质中的声波导致产生交替的高压（压缩）和低压（稀疏）循环，其速率取决于频率。 在低压循环期间，高强度超声波在液体中产生小的真空气泡或空隙。 当气泡达到不能再吸收能量的体积时，它们在高压循环期间剧烈塌陷。 这种现象称为空化现象。 在内爆期间，局部达到非常高的温度（约5,000K）和压力（约2,000atm）。空化气泡的内爆也导致液体射流速度高达280 m/s。超声空化引起的物理化学变化，可应用于石墨烯制备。

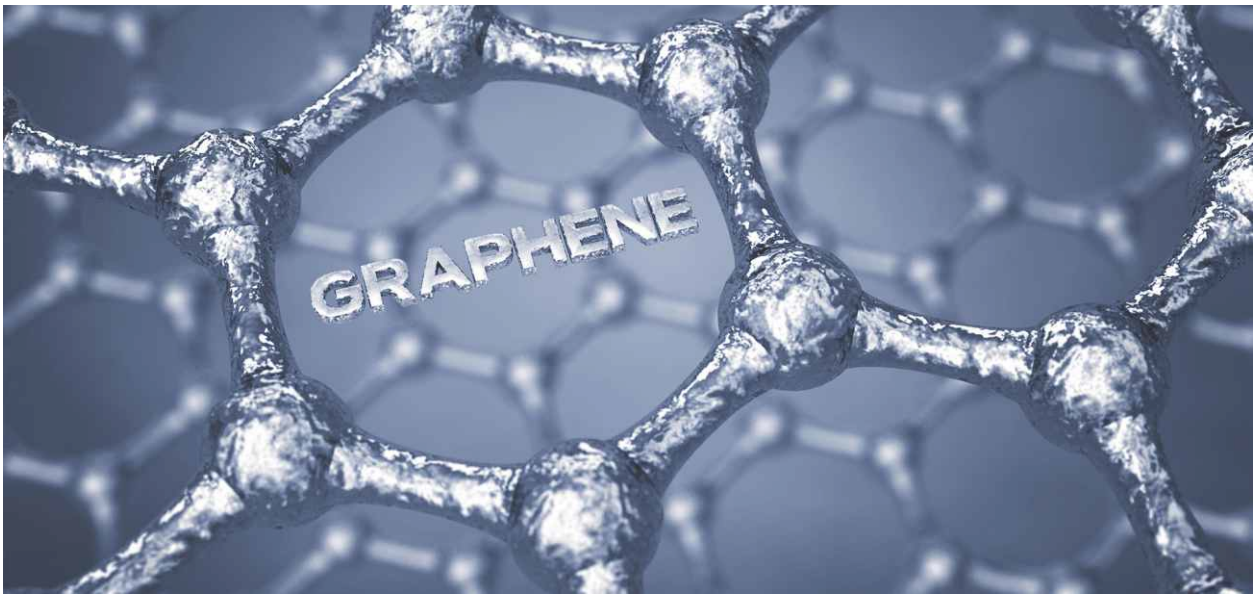
Cavitation is a phenomenon in which rapid changes of pressure in a liquid lead to the formation of small vapor–filled cavities, in places where the pressure is relatively low.When subjected to higher pressure, these cavities, called "bubbles" or "voids", collapse and can generate an intense shock wave. The physical and chemical changes caused by ultrasonic cavitation can be applied to the preparation of graphene.



超声波石墨烯分散 Ultrasonic graphene dispersion

“石墨烯是宇宙中最薄的物质，也是有史以来最坚固的物质。其表现出巨大的本征载流子迁移率，具有最小的有效质量（为零），可以在室温下进行微米长距离的传播而不散射。石墨烯可以维持比铜高6个数量级的电流密度，显示出创纪录的热导率和硬度，不透气，并能调和脆性和延性等相互冲突的特性。由于这些优异的材料特性，石墨烯是最有前途的材料之一，并且是纳米材料研究的焦点。

"Graphene is the thinnest substance in the universe and the strongest substance ever. It exhibits a large intrinsic carrier mobility and has the smallest effective mass (zero). It can carry out micron long–distance propagation without scattering at room temperature. Graphene maintains a current density of six orders of magnitude higher than copper, showing record thermal conductivity and hardness, air–tight, and reconciling conflicting properties such as brittleness and ductility. Because of these excellent material properties, graphene is one of the most promising materials and the focus of nanomaterials research.



超声波石墨烯分散设备是利用超声波的空化作用来分散团聚的颗粒。它是将所需处理的颗粒悬浮液（液态）放入超强声场中，用适当的超声振幅加以处理。在空化效应，高温，高压，微射流，强振动等附加效应下，分子间的距离会不断增加，最终导致分子破碎，形成单分子结构。该产品尤其对于分散纳米材料（如碳纳米管、石墨烯、二氧化硅等）有良好效果。

Ultrasonic graphene dispersion equipment uses ultrasonic cavitation to disperse agglomerated particles. It is to put the particle suspension (liquid) to be treated into the super sound field and treat it with appropriate ultrasonic amplitude. Under the additional effects such as cavitation effect, high temperature, high pressure, micro jet and strong vibration, the distance between molecules will continue to increase, resulting in molecular fragmentation and the formation of single molecular structure. The product is especially effective for dispersing nano materials (such as carbon nanotubes, graphene, silica, etc.).

实验级声化学设备 Experimental sonochemical equipment

- 规格型号：HC–LP2010GL （Specification and model）
- 功率:1000W （power）
- 工作频率：20.0 ± 1kHz （Working frequency）
- 输入电压 : 220V/50Hz （Input voltage）
- 换能器最高承受温度 : 85℃ （Maximum withstand temperature of transducer）
- 冷却方式：气冷 （Cooling mode: air cooling）
- 工具头：高强度钛合金 （Tool head of industrial sonochemical equipment: high strength titanium alloy）

恒温循环分散设备 Constant temperature circulating dispersion equipment

- 超声波搅拌设备升级简单，无需改变客户现有的生产设备和工艺流程。
  The upgrade of ultrasonic mixing equipment is simple, and there is no need to change the existing production equipment and process flow of customers.
- 聚焦式设计，能量密度大，产量和效率可以得到明显的提高，超声能量转化率高达80%以上。
  Focusing design, high energy density, obvious improvement of output and efficiency, and ultrasonic energy conversion rate of more than 80%.
- 采用超声波数控驱动电源，全数字电路控制，抗干扰能力强。
  It adopts ultrasonic numerical control driving power supply and full digital circuit control, with strong anti–interference ability.
- 频率和功率可实时监控，功率连续可调，具有自动报警保护功能，操作简便。
  The frequency and power can be monitored in real time, and the power can be continuously adjusted.It has the function of automatic alarm protection and simple operation.
- 安装简易，通过标准法兰盘对接安装，降低成本，节省能耗。
  It is easy to install. It is butt installed through standard flange to reduce cost and save energy consumption.
- 设备可用于高温高压高粘度等各种工作环境，并可根据客户要求，为客户量身订做使用方案，也可多套组合使用，增加辐射面积，提高产量。
  The equipment can be used in various working environments such as high temperature, high pressure and high viscosity, and can customize the use scheme for customers according to customer requirements. It can also be used in combination with multiple sets to increase the radiation area and increase the output.

菱形超声处理系统
Diamond ultrasonic processing system

锥形超声处理系统
Conical ultrasonic processing system

九节鞭形超声处理系统
Nine whip ultrasonic processing system

参数 Parameter

- 规格型号：HC–LP2030GL
  Specification and model
- 功率:3000W
  Power
- 工作频率：20.0 ± 1kHz
  Working frequency
- 输入电压 : 220V/50Hz
  Input voltage
- 换能器最高承受温度 : 85℃
  Maximum withstand temperature of transducer
- 冷却方式：气冷
  Cooling mode: air cooling
- 工具头：高强度钛合金
  Tool head of industrial sonochemical equipment: high strength titanium alloy

超声波金属熔体设备 Ultrasonic metal melt equipment

气孔是铝合金铸件的主要缺陷之一，因为它会损害铸件的机械性能和压力密封性。铸件中出现气孔是因为气体在凝固过程中从溶液中沉淀出来，或者因为液态金属无法通过枝晶间区域来补偿与凝固相关的体积收缩。氢气是唯一可明显溶于熔融铝的气体。因此，从熔融铝合金中去除溶解的氢对于生产高质量铸件至关重要。目前有几种方法用于对铝进行脱气 。这些方法包括使用氮气或氩气，或其中任何一种与氯气的混合物作为吹扫气体 。其他技术包括使用六氯乙烷 片剂进行片剂脱气、真空脱气 和超声波脱气 。超声波脱气是一种环境清洁且相对便宜的技术，它使用高强度超声波振动在熔融铝中产生振荡压力。脱气需要将足够强度的声能引入熔体中，以建立压力变化，从而引发空化 。大多数材料的液体形式的空化需要在 20 kHz 频率下的最小声学强度为10 w/ cm2。

pmax = p0 + 2ρcI , (3.1)　　pmin = p0 – 2ρcI , (3.2)，其中 p0 是大气压； ρ 和 c 分别是熔体的密度和波速； I 是熔体中的波能密度。 因此，对熔体施加超声波能量会导致局部压力从最小值到最大值的瞬时变化。 空化过程中的低压会产生微小的气泡。

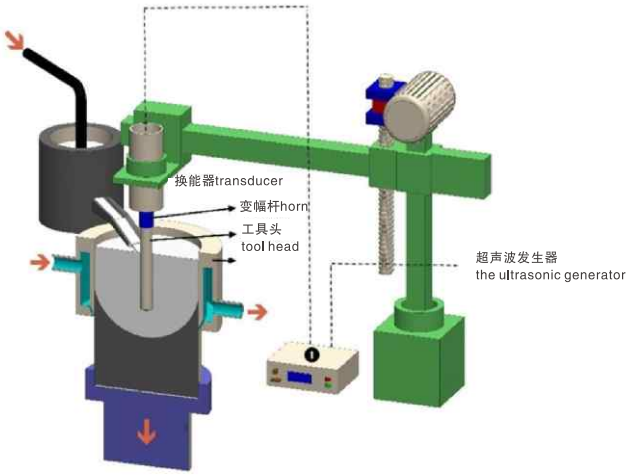
Porosity is one of the main defects of aluminum alloy castings, because it will damage the mechanical properties and pressure tightness of castings. Porosity in castings is due to the precipitation of gas from the solution during solidification, or because liquid metal cannot compensate for solidification related volume shrinkage through the interdendritic region. Hydrogen is the only gas that is significantly soluble in molten aluminum. Therefore, the removal of dissolved hydrogen from molten aluminum alloy is very important for the production of high–quality castings. At present, there are several methods for degassing aluminum. These methods include using nitrogen or argon, or a mixture of any of them with chlorine, as the purge gas. Other technologies include tablet degassing, vacuum degassing and ultrasonic degassing using hexachloroethane tablets. Ultrasonic degassing is a clean and relatively cheap technology. It uses high–intensity ultrasonic vibration to produce oscillating pressure in molten aluminum. Degassing requires the introduction of sound energy of sufficient strength into the melt to establish pressure changes and cause cavitation. Cavitation in the liquid form of most materials requires a minimum acoustic intensity of 10 W / cm2 at a frequency of 20 kHz.

pmax = p0 + 2ρcI , (3.1)　　pmin = p0 – 2ρcI , (3.2)，Where P0 is atmospheric pressure; ρ And C are the density and wave velocity of the melt, respectively; I is the wave energy density in the melt. Therefore, the application of ultrasonic energy to the melt will lead to the instantaneous change of local pressure from minimum to maximum. The low pressure in the process of cavitation will produce tiny bubbles. Under high pressure, bubbles burst and produce shock waves. Ultrasonic induced cavitation can be used for degassing.

产品特征 Product features

超声波装置主要零部件有超声波发生器、换能器和导入杆（变幅杆、工具杆）等。其工作原理是压电换能器， 将一定功率和频率的电信号转化成同频率的机械振动，变幅杆将此振动的振幅放大，通过工具杆将超声振动导入金属熔体中， 对其进行超声处理。 在高压下，气泡破裂并产生冲击波。超声波诱导空化可用于脱气。

The main components of ultrasonic device include ultrasonic generator, transducer and guide rod (horn, tool rod), etc. Its working principle is that the piezoelectric transducer converts the electrical signal of a certain power and frequency into mechanical vibration of the same frequency. The amplitude of the vibration is amplified by the horn, and the ultrasonic vibration is introduced into the metal melt through the tool rod for ultrasonic treatment.



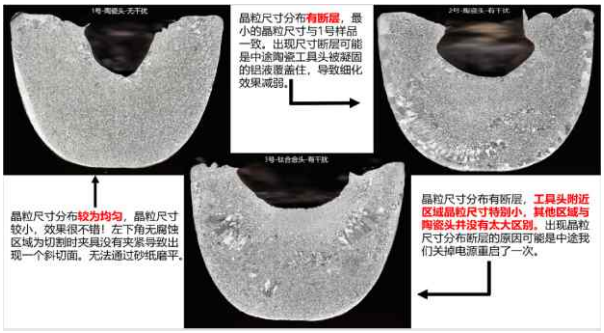
去除杂质 Remove impurities	提升铸坯质量 Improve slab quality	超声波除气 ultrasonicDegassing	细化晶粒 refinegrain

工具杆能否长久稳定高效地向金属熔体传导超声波，直接影响到金属的凝固组织和力学性能，因此，超声波工具杆对铸件成品的使用性能起到至关重要的作用。

在金属熔体超声波铸造过程中，工具杆直接和高温金属熔体接触，起到传导超声波的作用，实现对金属熔体的超声处理。在高温熔体环境下，高温熔蚀及热应力的共同作用会使普通材质的工具杆迅速破坏。陶瓷材料具有耐高温熔蚀、耐磨损等优点，已作为超声波工具头的选材。

Whether the tool rod can transmit ultrasonic wave to the metal melt stably and efficiently for a long time directly affects the solidification structure and mechanical properties of the metal. Therefore, the ultrasonic tool rod plays an important role in the service performance of the finished casting.In the process of ultrasonic casting of metal melt, the tool rod directly contacts the high–temperature metal melt, plays the role of conducting ultrasonic and realizes the ultrasonic treatment of metal melt. Under the high temperature melt environment, the common tool rod will be destroyed rapidly under the combined action of high temperature melting corrosion and thermal stress. Ceramic materials have the advantages of high temperature corrosion resistance and wear resistance, and have been used as the material of ultrasonic tool head.

- 平端面工具头空化作用和声流作用最强
  The cavitation effect and sound flow effect of flat end tool head are the strongest.
- 平端面工具头铸件晶粒的细化效果最好
  The grain refinement effect of flat face tool head casting is the best.
- 氮化硅陶瓷导波杆具有良好的耐高温特性
  Silicon nitride ceramic waveguide rod has good high temperature resistance.
- 氮化硅陶瓷棒可以承受高温钢液的熔蚀
  Silicon nitride ceramic rod can withstand the melting corrosion of high temperature liquid stee.l
- 氮化硅陶瓷棒无黏附现象，不会破坏金属层
  The silicon nitride ceramic rod has no adhesion and will not damage the metal layer.



超声波浸焊设备
Ultrasonic Dipping Soldering Equipment

Product characteristics

Ultrasonic dipping soldering allows welding of different materials and can be used to welding difficult-welded material by conventional methods. Because it does not need flux, users can save time and cost of cleaning flux residues, while reducing corrosion and increasing the durability of welded joints. Tin-lead solders are usually used to weld wettable metals such as silver, copper and nickel. Tin-silver solders are used for stainless steel, tin-zinc and zinc-aluminium alloys for aluminium, and indium alloys for glass and ceramics.

Ultrasonic energy introduced into a dip solder pot eliminates the need for flux while enhancing many soldering processes. It also provides a means to bond solder to a number of materials including aluminum and glass that are difficult or impossible to solder using conventional soldering techniques. HC-SONIChas perfected a technique for introducing ultrasonic energy into dip solder pots and is the exclusive manufacturer of this type of equipment in China.

产品特点

超声波浸焊允许焊接不同的材料，并且可以用于焊接常规方法难以焊接的材料。因为它不需要助焊剂，用户可以节省清洗助焊剂残留的时间和节约成本，同时减少腐蚀并增加焊接接头的耐久性。锡铅焊料通常用于焊接易湿润的金属，如银、铜、镍。锡-银焊料用于不锈钢，而锡-锌和锌-铝合金用于铝，铟合金经常用于玻璃和陶瓷。

超声波浸焊过程中，一个单独的能量源产生的热量用做熔化填充金属，然后再加入超声波振动能量，熔融的焊料用作超声波振动的传输介质。当将高频振动能量应用于熔融焊接时，在焊接工具表面会产超声空化，以分解和分散表面氧化物。空泡的微泡破裂，清洗焊件表面，使湿润的焊料能与纯金属结合。

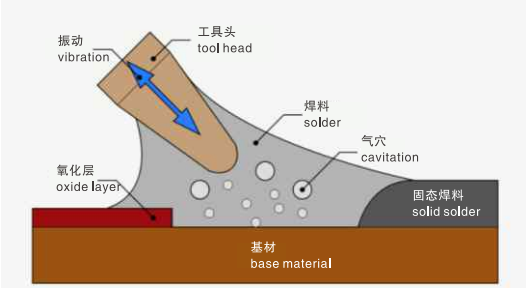
技术参数
Technical parameters

使用频率 Frequency	19-35KHZ	功率范围 Power range	300-1000W
温度范围 Temperature range	200-400℃	工作振幅 Working amplitude	3-20μm
工具头材质 Tool head material	模具钢 Die steel	工作模式 Working mode	间歇/连续 Intermittent/Continuous
冷却方式 Cooling mode	风冷 Air cooling	外壳材质 Shell Material	铝合金 Aluminium alloy

超声波电烙铁 Ultrasonic electric soldering iron

超声波锡焊是一种无焊剂的焊接方法，与传统的焊接方法相比，它被认为更加环保。用振动和空化现象从焊接表面去除表面氧化层，而不是化学剂。

超声波锡焊技术不同于超声波塑料焊接，是通过振动产生热量来熔化被连接的部件。超声波锡焊的使用原理与超声波清洗的过程基本相同，振动能量在水浴或清洗溶剂中引起空化。浸入液体介质中的部分，通过空化气泡强烈的侵蚀作用将表面清洗干净。



Ultrasonic tin welding is a flux free welding method. Compared with the traditional welding method, it is considered to be more environmentally friendly. Remove the surface oxide layer from the welding surface by vibration and cavitation instead of chemical agent.Ultrasonic tin welding technology is different from ultrasonic plastic welding. It melts the connected parts by generating heat through vibration. The use principle of ultrasonic soldering is basically the same as that of ultrasonic cleaning. Vibration energy causes cavitation in water bath or cleaning solvent. The part immersed in liquid medium will clean the surface through the strong erosion of cavitation bubbles.

应用范围 Scope of application

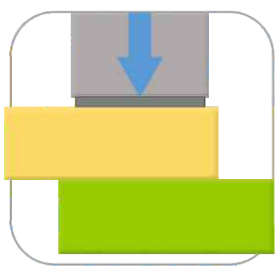
- 玻璃饰品制造
  Glass jewelry manufacturing
- 光学眼镜镀膜/金属化
  Optical glasses coating / metallization
- 玻璃和陶瓷板上制作电极
  Working frequency
- 在汽车后窗加热触点焊接
  Electrodes are made on glass and ceramic plates
- 焊接超导体、元件，陶瓷配件
  Welding superconductors, components, ceramic accessories
- 玻璃管真空密封，五金配件粘接
  Vacuum sealing of glass tube, bonding of hardware fittings
- 光导玻璃纤维的密封（金属箍接合）
  Sealing of optical waveguide glass fiber (metal hoop joint)
- 电极结合到太阳能电池（结晶，薄膜）的前/后接触
  The electrode is bonded to the front / rear contact of the solar cell (crystalline, thin film)
- 在金属玻璃，液晶玻璃，晶体振荡器，混合集成电路引线（网点）粘接
  In metal glass, liquid crystal glass, crystal oscillator, hybrid integrated circuit lead (DOT) bonding

超声波口罩焊接设备

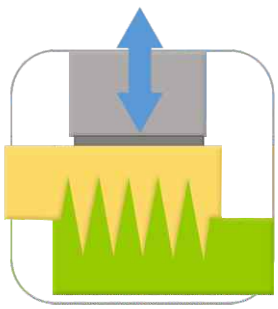
Ultrasonic Face Mask Welding Machine



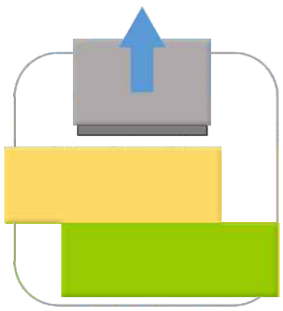
超声波口罩焊接机是利用高频振动波传递到两个需焊接的物体表面，在加压的情况下，使两个物体表面相互摩擦而形成分子层之间的熔合。



将焊接工具头压到接材料上
Press the welding tool head onto the joining material



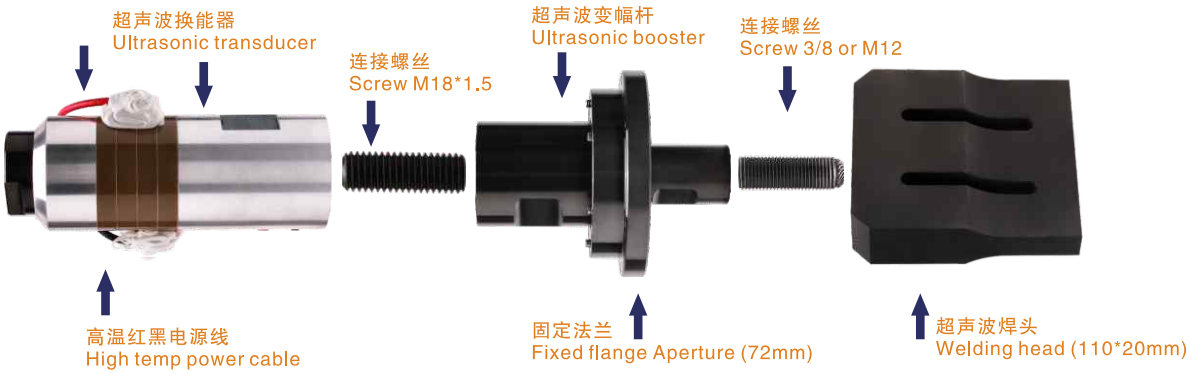
工具头每秒产品20000振动
Press the welding tool head onto the joining material



振动产生了热摩擦 受热–熔化–熔合
Vibration creates thermal friction. Heated–melted–fused

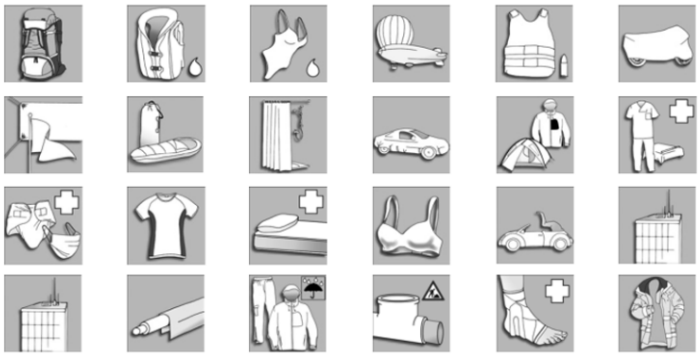
The ultrasonic face mask welding machine uses high–frequency vibration to transmit to the surfaces of two products to be welded. Under pressure, the surfaces of the two products rub against each other to form a fusion between molecular layers.

超声波焊接机剖视图
Ultrasonic welding sectional view



When the ultrasonic wave acts on the contact surface of the thermoplastic material, it will generate tens of thousands of high-frequency vibrations per second. This high-frequency vibration with a certain amplitude will transmit the ultrasonic energy to the welding zone through the upper weldment. The acoustic resistance at the welded interface is large, so local high temperatures are generated. Due to the poor thermal conductivity of the plastic, it could not be distributed in time, and it gathered in the welding area, which caused the contact surface of the two plastics to melt quickly. After a certain pressure was added, it was merged into one. Some indentations can be seen everywhere on the mask, such as edge welding, ear straps, and exhalation valves, all using ultrasonic welding technology.

超声波作用于热塑性材料的接触面时，会产生每秒几万次的高频振动，这种达到一定振幅的高频振动，通过上焊件把超声能量传送到焊区，由于焊区即两个焊接的交界面处声阻大，因此会产生局部高温。又由于塑料导热性差，一时还不能及时散发，聚集在焊区，致使两个塑料的接触面迅速熔化，加上一定压力后，使其融合成一体。口罩上面随处可以看到一些压痕，如封边、耳带、呼气阀处都采用了超声波焊接技术。



技术参数
Technical parameters

使用频率 Frequency	20KHZ	功率范围 Power range	500-3000W
最大振幅 Maximum Amplitude	10-100μm	工作模式 Working model	连续、间接 Continuous, intermittent
可焊接材料 Weldable materials	热塑性材料 Thermoplastic materials	焊头材料 Welding Head Material	铝、钢、钛合金 Al,Steel,titanium alloy
焊头尺寸 Welding Head Size	110*20\150*40mm	驱动类型 Driven Type	电动 Electric

超声波缝纫机芯 Ultrasonic sewing movement

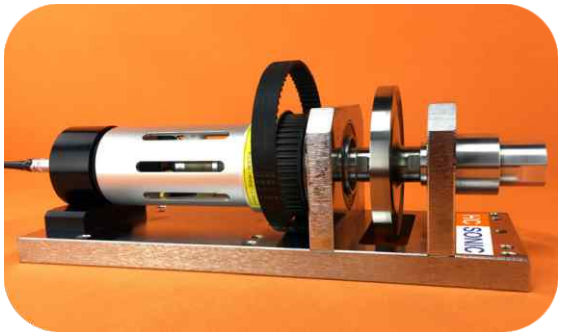
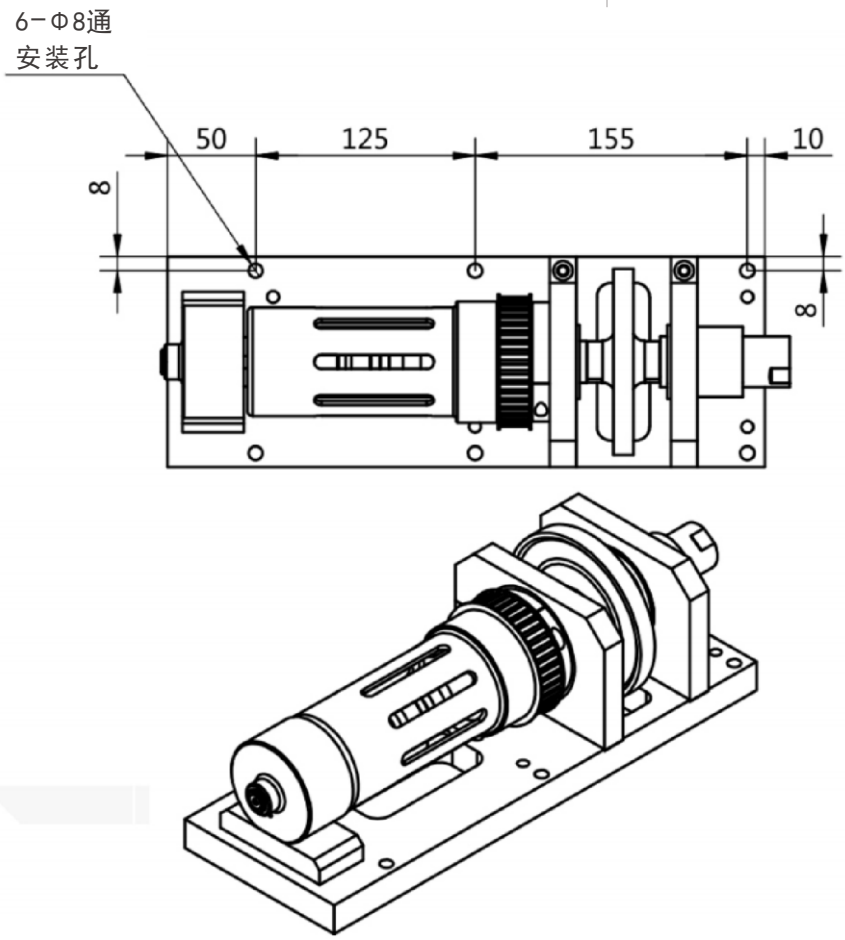


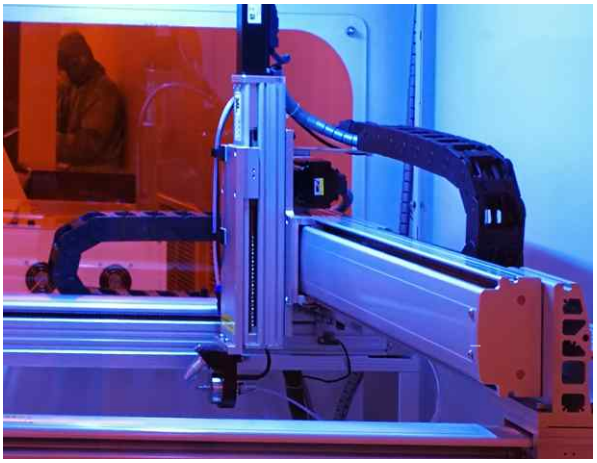
示意图 Sketch Map

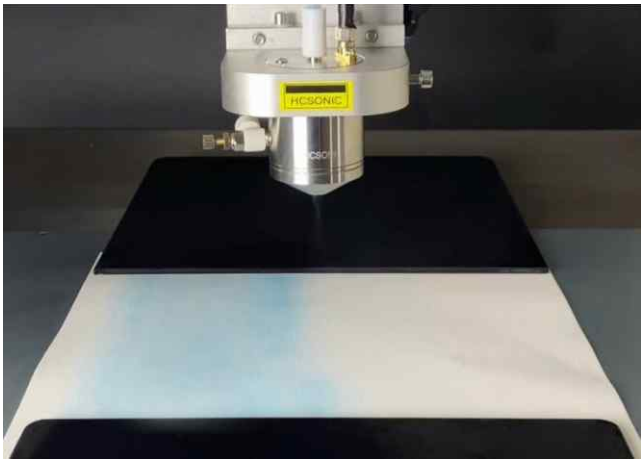


用户实例 USERINSTANCES

超声超高周疲劳试验
High cycle fatigue strength ultrasonic testing

多普勒激光校准
Doppler laser calibration





超声波雾化喷涂
Ultrasonic atomization spraying

超声波汽车配件切割
Ultrasonic cutting of automotive parts

汽车轮胎内衬切割生产线
Cutting production line for automotive tire lining

超声波石蜡乳化
Ultrasonic paraffin emulsification

超声波石墨烯循环生产线
Ultrasonic graphene circulation production line

超声波晶粒细化 Ultrasonic grain refinement

超声波浸焊设备 Ultrasonic dipping soldering equipment

资质及荣誉证书 QUALIFICATION AND HONOR CERTIFICATE

资质及荣誉证书 QUALIFICATION AND HONOR CERTIFICATE

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