



Component Coating Equipment

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Provide you with solutions for component coating equipment

Guangdong Huasheng Nanotechnology Co., Ltd



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Guangdong Huasheng Nanotechnology Co., Ltd

Headquarter address: No.36 Lianhuan Road, Dalingshan,Dongguan

Keneng R&D Center

Production address: No.2 Mashanmiao Road, Dalingshan,Dongguan

Abao Industrial Center

Tel: +86 182 5078 1592

E-mail: chenyaafen@hsvacuum.com



WeChat Felix Chen



WhatsApp Felix Chen

COMPANY PROFILE

Company Profile

Guangdong Huasheng Nanotechnology Co., Ltd (hereinafter referred to as "Huasheng") is a leading nano coating solution supplier in China, mainly engaged in the research and development, production and sales of vacuum coating equipment, as well as the research and development and application of coating processing technology. With leading strength in R&D of vacuum coating equipment and coating processing technology, Huasheng provides customers with comprehensive and integrated solutions.

As a technology-driven enterprise, Huasheng has obtained more than 100 patents, and has a test laboratory with million-level valued equipments. Huasheng R&D team has Ph.Ds and senior engineers from global famous universities and research institutes, greatly empowering Huasheng innovation& breakthrough in the field of coating.

Huasheng headquarter and R&D center are located in Dongguan, Guangdong Province, China. Furthermore, Huasheng established Chendu Institute, Xi'an North Service Center and set up manufaturing & operation centers and factories in Dongguan, Zhuzhou, Chengdu, etc. Huasheng has an industry-scale coating service center, always being ready to meet customer need with 7*24h fast response service.

Company Honour

Guangdong Huasheng Nanotechnology Co., Ltd

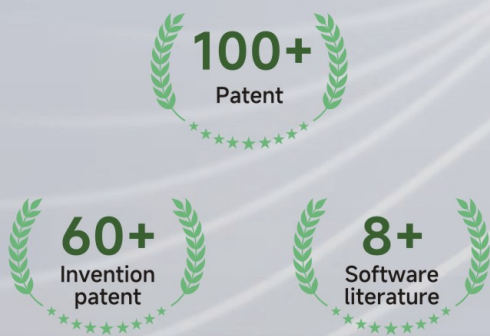


Second Prize of Science and Technology Invention of Guangdong Province in 2021
Dongguan City first (set) key technical equipment project
Guangdong Province famous high-tech products



National high-tech enterprises
Little giants
Innovative small and medium-sized enterprises
Guangdong Doctoral Workstation
Dongguan Nanomaterials (Huasheng) Engineering Technology Research Center
Dongguan key hard coating laboratory of composited ion coating equipment and application

Intellectual Property



National Layout Map



Company Certification



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Tribological coating equipment

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Best choice for cost-effectiveness

Fast deposition rate!
3 batches/day

Wear-resistant and friction-reducing
DLC coating deposition machine



2~4μm

3 batches
/day

Efficient
production
(maintenance-free,
low cost)

DLC1500MAX Equipment Parameter

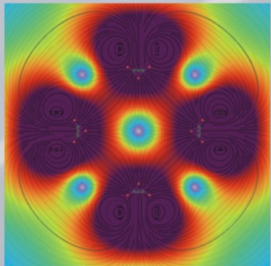
Properties	DLC1500MAX
Coating Technology	MS+PECVD
Coating Type	Cr/WC/a-C:H
Etching	SET
Cathodes (number)	4
Equipment Size (mm)	Length4900*Width1800*Hight2950
Cavity Volume (m³)	2
Effective Coating Area (mm)	Φ900*1000
Coating Deposition Temperature (°C)	< 200
Capacity (number of trees)	made-to-order
Max. Loading Weigh (KG)	1000
Shaft Diameter (mm)	largest dimensionΦ350
Processing time (h)	6-8



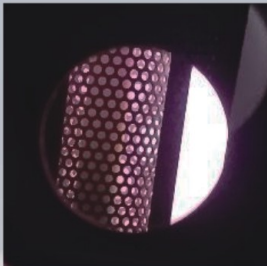
Utilized PECVD technology
(maintenance-free, low cost)

PECVD technology can achieve
high ionization rate
Fast deposition rate(>1μm/h)

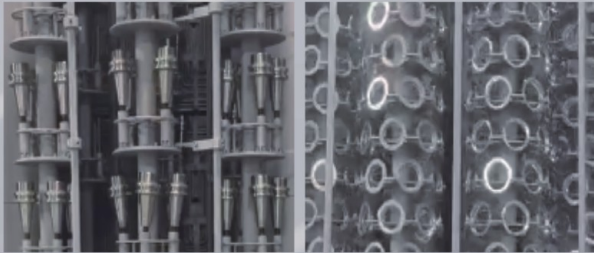
Unbalanced Closed Magnetic
Field Simulation



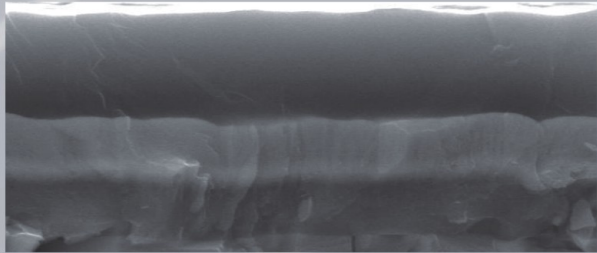
High density plasma



High coating production efficiency,
3 batches/day



Coating thickness 2~4 μm



Huasheng DLC coating performance parameters

Coating material	Transition layer + a-C:H top layer (amorphous carbon layer)
Technology	MS + PECVD
Coating color	Black
Coating thickness	2-4μm (according to product requirements)
Coating hardness	> 2500HV
Coating adhesion strength	HF1
Friction coefficient	< 0.1
Deposition temperature	< 200℃
Neutral salt spray test (45# steel)	< 96h

Applications of DLC coating



Wear-resistant parts



Injection molds



Aluminum forming molds

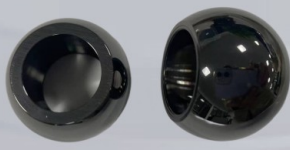
Applications in automobiles, civil aviation, semiconductors, 3C home appliances, textiles, medical care, mechanical engineering and other industries:



Intake valve



Piston pin



Joint bearing



Coffee machine /soy milk machine blade



Medical instrument



Slide bar



Rotary hook



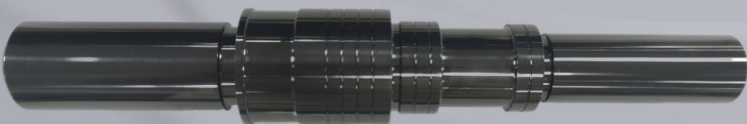
Auxiliary nozzles



Steel collar



Internal gear ring



Live shaft



Lithium battery coating die head

DLC800PRO Equipment Parameter

Properties	DLC800PRO
Coating Technology	MS+PECVD
Coating Type	Cr/WC/a-C:H
Etching	SET
Cathodes (number)	4
Equipment Size (mm)	Length 4100*Width1200*Hight2500
Cavity Volume (m³)	0.8
Effective Coating Area (mm)	Φ650*400
Coating Deposition Temperature (°C)	< 200
Capacity (number of trees)	10
Max. Loading Weigh (KG)	500
Shaft Diameter (mm)	Φ130
Processing time (h)	6-8



customizable

TLC1500



TLC1500

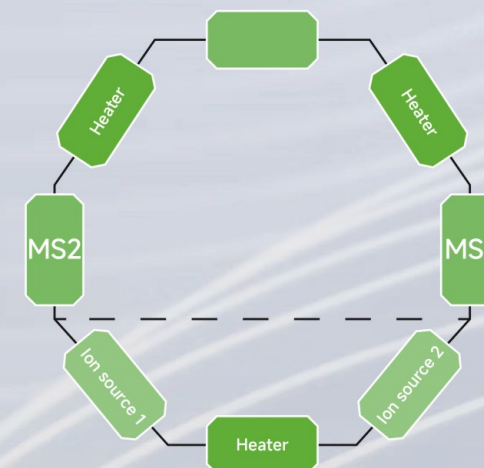
Magnetron sputtering + anode layer ion source

Hydrogen containing DLC coating

Deposition temperatures can be as low as 100°C

High hardness and wear resistance

Layout plan



Main configuration

- Two magnetron cathodes
- Two sets of anode layer ion sources deposited DLC

Effective coating area $\varphi 710 \times 900 \text{ mm}$

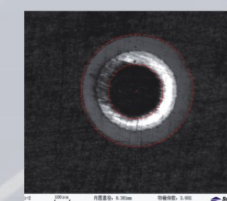
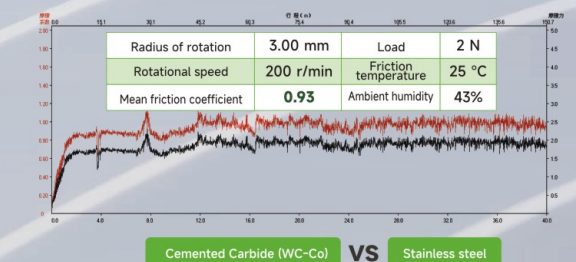
Equipment characteristics

- The anode layer ion source is used to ionize the carbon-containing gas and deposit the a-C:H coating
- DLC, CrN, WC, W-DLC and other coatings can be deposited
- The deposition temperature is low, the lowest is 100°C, and the substrate is wide
- Smooth surface, does not change the product roughness
- The branchus elegans has high hardness and low friction coefficient

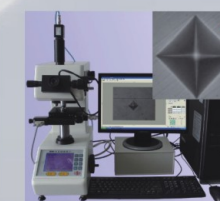
a-C:H Coating property

Coating material	Thickness	Hardness	Binding force
a-C:H	2-4 μm	> 2000HV	Higher than Hf2

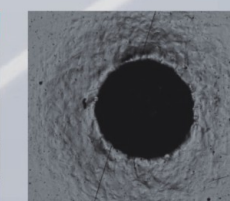
Coefficient of dry friction	Service temperature	Deposition temperature	Color
< 0.1	< 300°C	< 200°C	Black



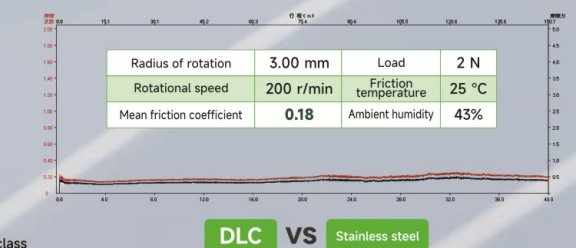
DLC thickness(3.7 μm)



Hardness > 2000HV0.025



Indentation binding force (VDI3198)HF1 class



DLC Coating application

Applications in fuel vehicles



Application in decoration industry



Application in home appliance industry



ta-C Coating equipment

LAS800



Smooth surface
Low roughness

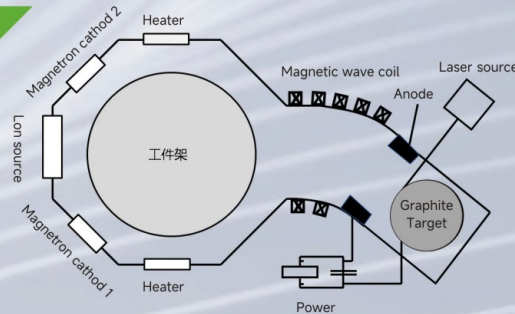
Hardness
5-60GPa

Thickness
0.1-15μm

Uniform coating area
H400mm*φ650

Equipment introduction and structure

Laser filtered arc LAS800 coating equipment uses pulsed laser + arc technology, combined with a rectangular magnetic filter tunnel. It can deposit ultra-low friction coefficient, low roughness, and ultra-hard ta-C coating, which is suitable for larger parts.

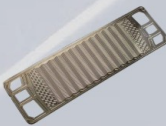


Technical features

- Advanced Technology** TechnologyPulse laser + arc technology accurately controls arc spot movement.
- Few droplets on surfLaacseer** Laser scanning avoids overheating of the target and reduces the formation of large particles.
- Low roughness** The composite magnetic field filters the droplets generated during the ionization process and has low surface roughness.
- Large uniform** The combination of cylindrical target and rectangular magnetic filter tunnel, uniform coating area is large, suitable for larger parts.
- Excellent performance** Ultra-low friction coefficient, low roughness, super hard, scratch resistance, wear resistance, improve product life.

Application area

➤ Main application areas: new energy, smart wearables, consumer electronics, high-precision processing



Bipolar Plates

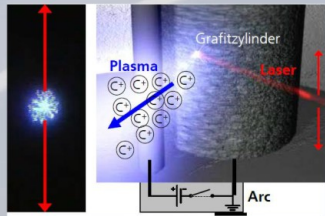


Smart Ring

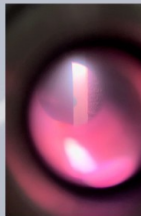


Micro Drill

Discharge diagram



Schematic diagram of laser driven arc discharge



Discharge photos

Laser ta-C coating performance

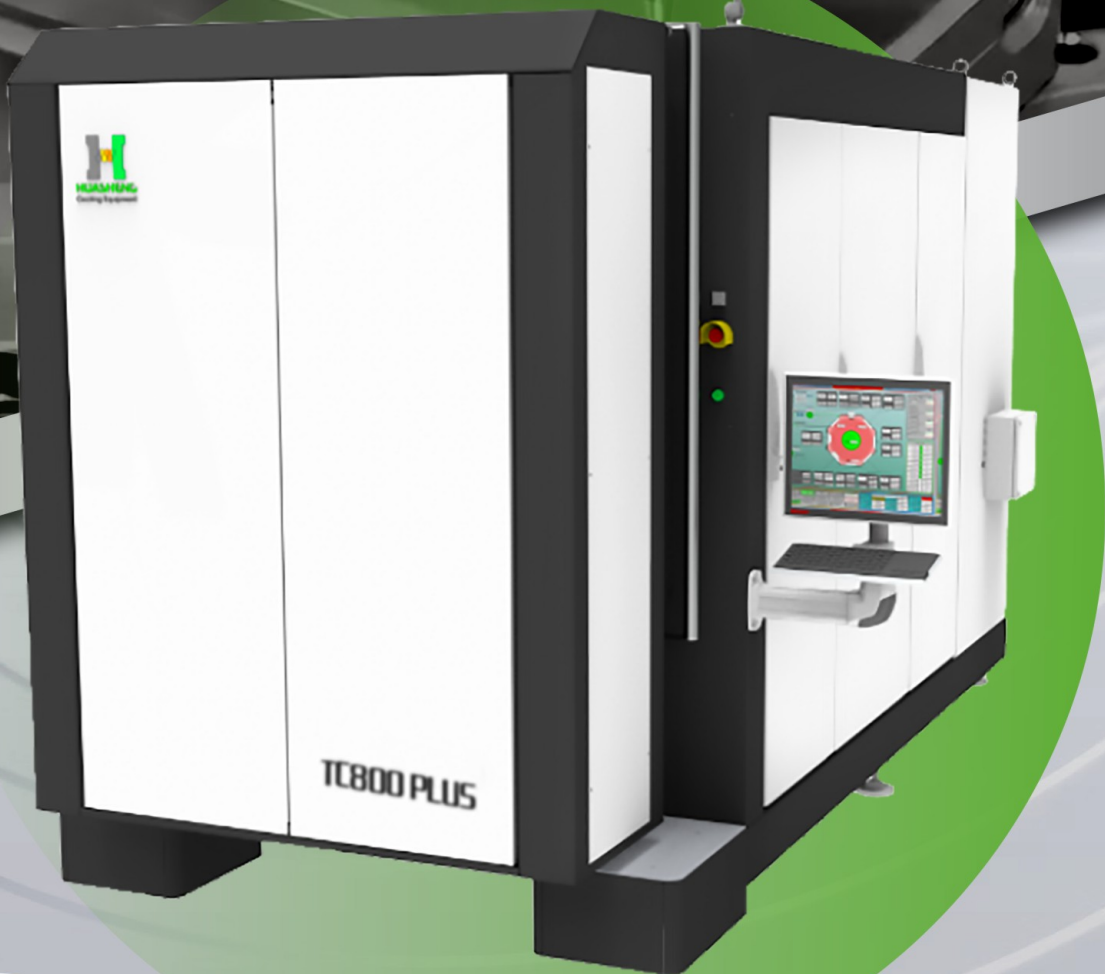
Coating thickness(μm)	0.1-15	Deposition temperature(°C)	≤200
Hardness(GPa)	5-60	Antioxidant temperature(°C)	450
Roughness (μm)	≤0.08 (thickness<0.8μm)	Optical properties	Infrared and visible spectrum transmittance>95%
Wear rate(mm³/N·m)	≤10 ⁻⁸ (Dry friction)	Friction coefficient(CoF)	< 0.1 (Dry friction)
Application matrix	Vcaerious types of steel, titanium alloy, aluminum alloy, copper alloy, cemented carbide, etc.		

Parameter

- Laser energy/frequency
- Coil current
- Electron absorber
- Target voltage
- Bias voltage
- Chamber pressure

TC800 Plus

Model Parameter



Flexible automation

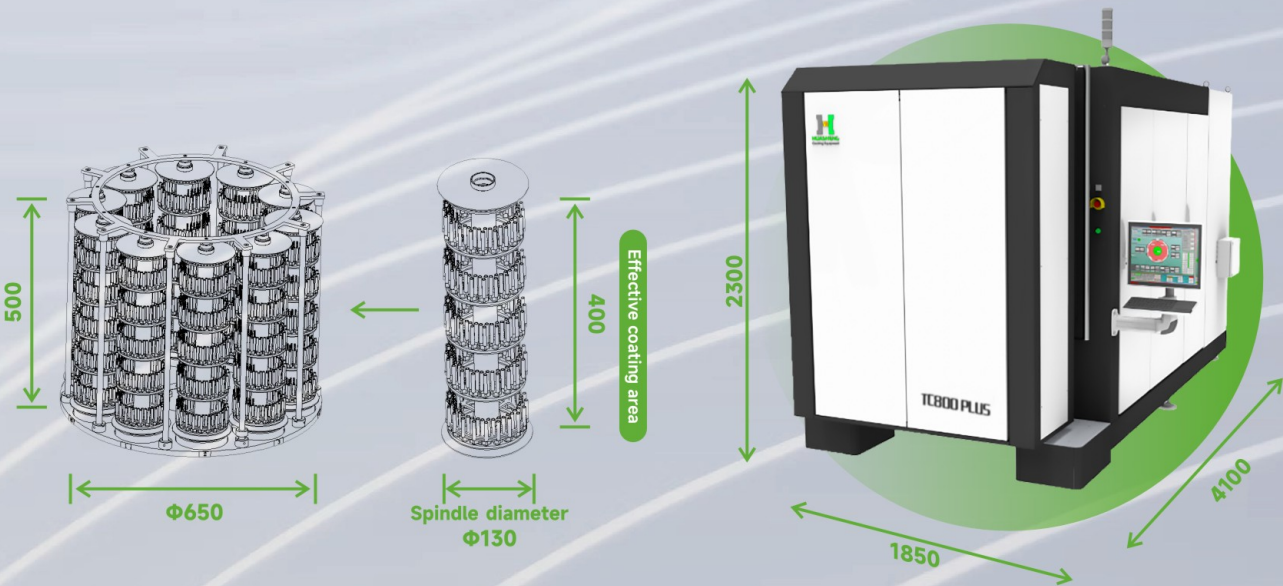
Steady mass production

Low temperature deposition <200°C

Low cost per piece

Equipment introduction

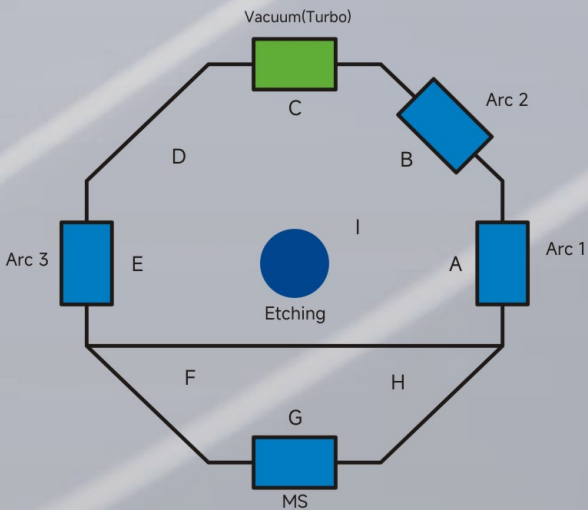
Huasheng independently developed a new composite machine TC800 Plus, which combines the advantages of ion source, magnetron sputtering, and multi-arc ion plating technology to meet different film performance requirements.



Coating technology	Arc	Equipment size	L4100*W1850*H2300
Rodcutter loading capacity (D4*50L)	2400pcs	Maximum working temperature(°C)	200
Maximum loading weight(KG)	500	Volume(m³)	1
Effective coating area(mm)	Φ650*400	Coating time(h)	3-6

Equipment layout

Properties	TC800 PLUS
Ion source (cathode + anode)	1 set
Arc sources	3*Arc+1*Cathode
Arc source arrangement	Misaligned arrangement
Advantage	High cost effective and short production cycle



TC800 Plus Model Introduction

Plasma etching

High-energy plasma effectively cleans product surfaces; Post-maintenance is convenient and flexible; High-energy plasma can efficient etching product surfaces.

Transition layer deposition: Magnetron sputtering

Non-balanced magnetic field design, high utilization rate of targets; Optional transition layer: Cr, WC, Ti...; High-quality coating, low coating stress.

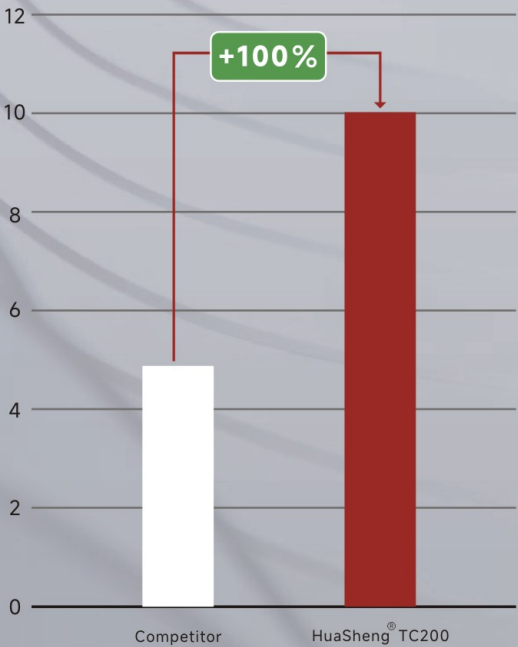
ta-C layer: AIP

3 arc graphite target sources plus permanent magnet achieve high efficiency and uniform deposition ta- coating with high hardness and high wear resistance.

Equipment application

Application case

Tool Life/minutes



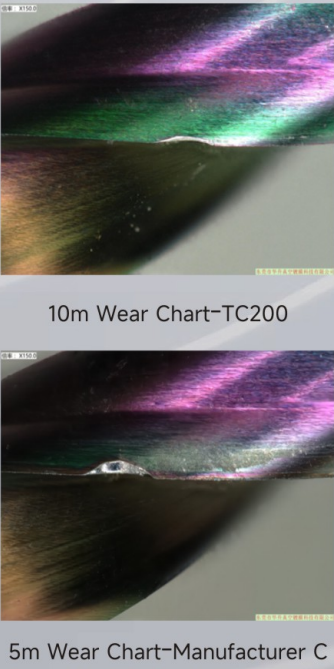
Tools:
1.8*9

Workpiece:
Aluminum substrate
(3W; copper thickness 70)

Cutting Parameters:
Cutting speed Vc = 264m/min
Milling speed F = 0.96m/min
Cutting depth ap = 4.8mm
Cooling method: Air cooling

Test Results:
Huasheng TC200 coated tool can process 10m;
K manufacturer's T-coated tool life is 5m;
Cutting life increased by 100%

Data source:
Huasheng Cutting Laboratory



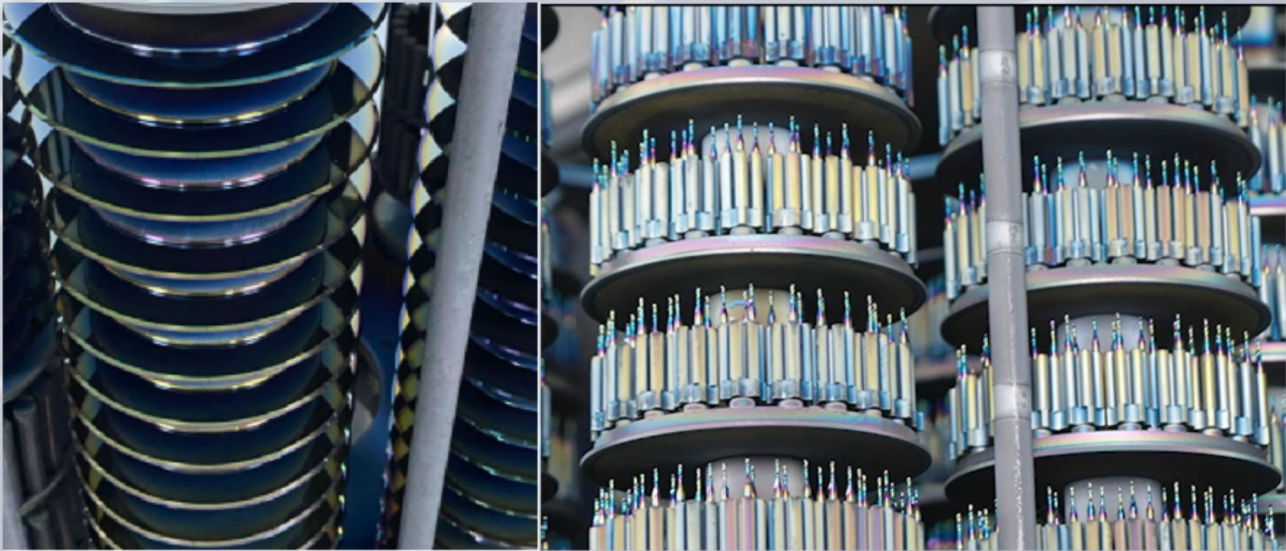
Equipment technology

HUASHENG® TC200- Aluminum alloy processing coating

HuaSheng®TC200

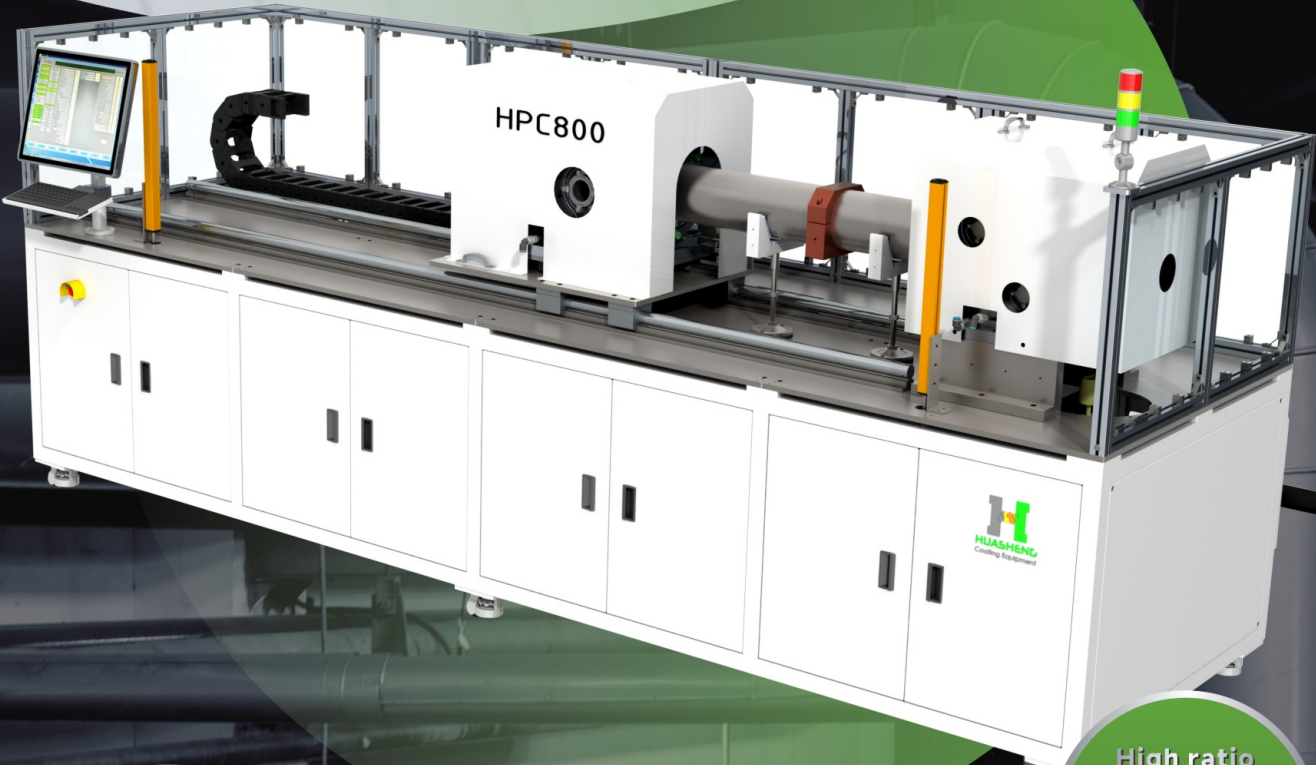
Apply

- ◆ Processing of aluminum-siliconalloy (Si < 12%)
- ◆ Processing of aluminum substrate
- ◆ Plastic processing



Coating composition	ta-C
Coating color	dazzling
Coating thickness (μm)	0.35±0.05
Coating hardness (Gpa)	> 40
Friction coefficient (dry)	< 0.1
Coating temperature (°C)	< 200
Maximun operating temperature (°C)	< 450

Internal surface coating equipment



PECVD with hollow cathode discharge technology

Thickness 2-30um

Hardness 5-25GPa

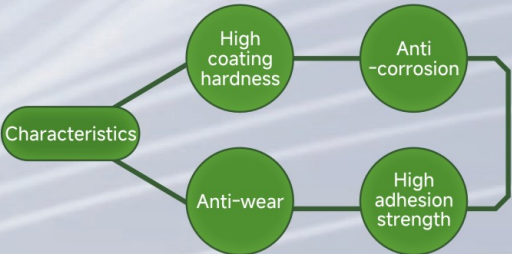
High ratio between length and internal diameter (up to 20:1)

Internal surface DLC coating
— anti-corrosion and lubrication

HPC800

Internal surface DLC coating

- Carbon-based coating, low adhesion tendency, excellent anti-corrosion property
- High hardness, low wear volume, high shear strength of multilayer structures
- Smooth surface, do not increase surface roughness during coating process, effectively avoid changing tube structure and fluid flow state



Application areas

- Advanced technology: PECVD with hollow cathode discharge technology
- Large range of tube size: High ratio between length and internal diameter (up to 20:1) and long tube length (up to 3m)
- Large range of performance adjustment capability: Easy to adjust coating thickness/hardness/element doped, etc.
- Automation equipment: Software is simple to operate and easy to adjust process parameters



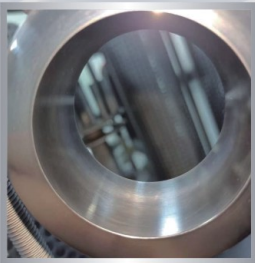
chemical engineering



petroleum



daily life



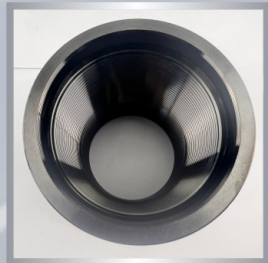
Internal
Φ50mmx50mm



Internal
Φ75mmx200mm



Internal
Φ100mmx250mm



Internal
Φ150mmx200mm

Internalsurface DLC coating performance parameter

PECVD with hollow cathode discharge technology—property of DLC coating

Thickness (um)	2-30
Hardness (GPa)	5-25(Adjustable hardness according to actual application scenarios)—— 304 Stainless steel≈2GPa
Wear rate	≤10 ⁻⁷ (Dry friction)—— 304 Stainless steel wear rate≈10 ⁻³ mm ³ /(N·m)
Coefficient of friction	0.1-0.2(Dry friction)
Deposition temperature	≤250
Application base materials	Various steel materials, Ti, Al, Mg, Ni alloys, SiC/Si materials
Deposition rate	≥0.5 μm/min

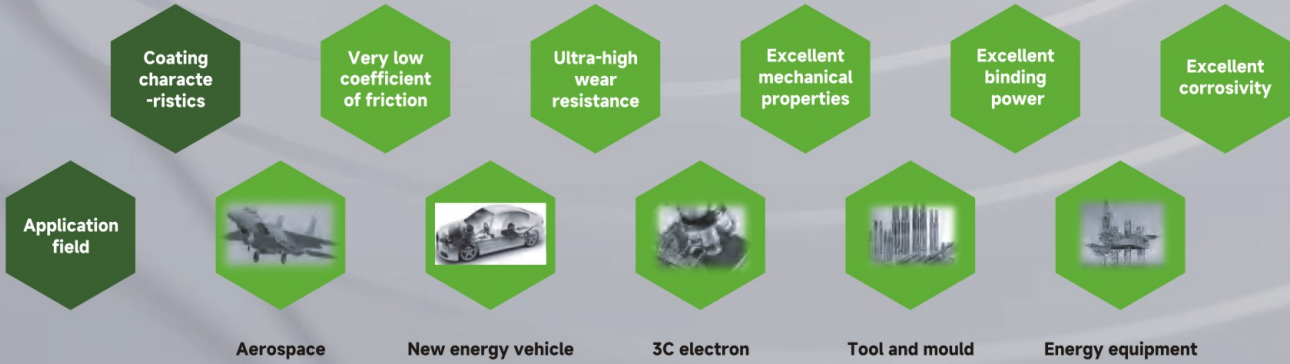
RECOMMENDED PROCESS
FOR TRIBOLOGICAL COATING

Tribology Coating Process Table

Coating material	a-C:H	a-C:H:W	CrN	ta-C	ta-C plus
Technology	Magnetron Sputtering & PECVD	Magnetron Sputtering	Magnetron Sputtering	ARC	Laser&ARC
Thickness(μm)	2-4	2-4	1-20	0.3-1.0	0.2-10.0
Hardness(HV)	2000-3000	800-2200	1600-2000	4000-6000	2500-7500
Coe. of friction	0.05-0.15	0.1-0.2	0.5-0.6	0.05-0.15	0.05-0.15
Highest temp.	< 300°C	< 350°C	< 700°C	< 450°C	< 450°C
Coating temp.	< 200°C	< 200°C	150°C-300°C	< 200°C	< 200°C
Machining range	Sliding friction and turn of axis,shaft	Heavy loading	Parts	Nonferrous metal, plastic	Nonferrous metal, plastic

Huasheng DLC coating application recommendation (wear-resistant parts)

Coating material	Hardness (HV)	Friction coefficient (dry)	Typical coating thickness(μm)	Service temperature (°C)	Deposition temperature (°C)	Binding power (level)	Attrition rate	Colour
a-C:H	> 2500	< 0.1	2-4 (according to product requirements)	300	< 200	HF1	As low as 10 ⁻⁸ mm ³ N ⁻¹ m ⁻¹	Black



COMPONENT COATING SOLUTIONS

Application of DLC coating in industry

Drive unit



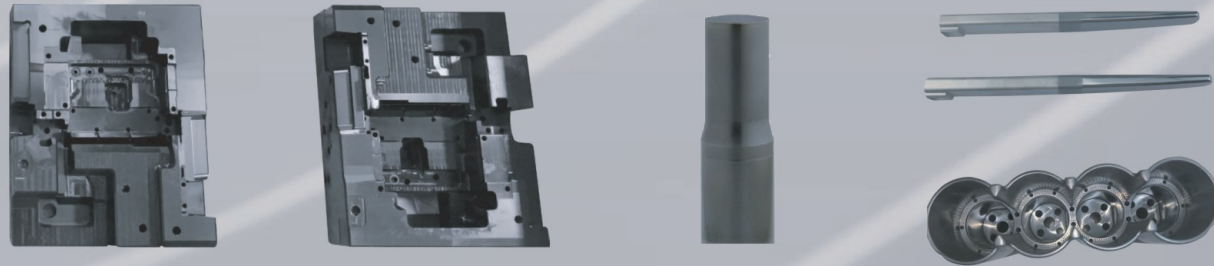
Die-cutting tool



Intelligent Wearable



Mold

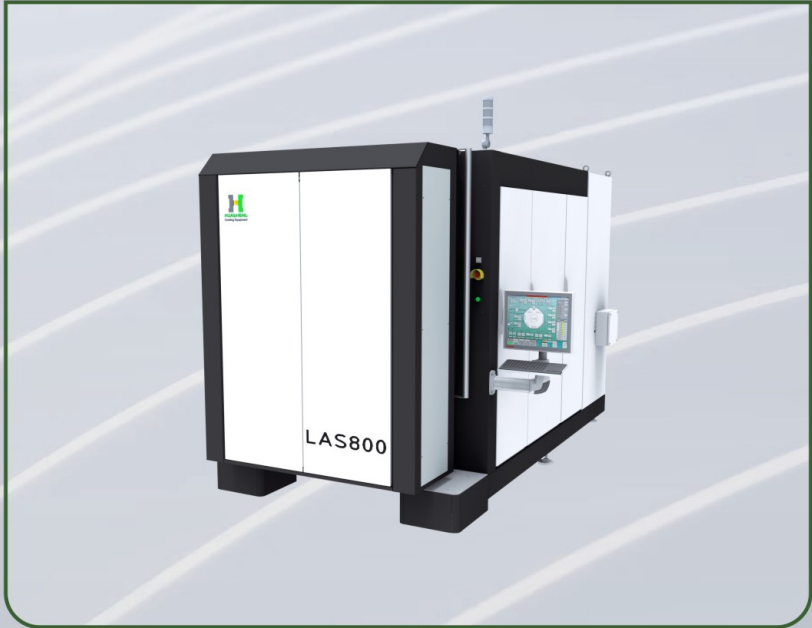


Component Coating Equipment

TLC Series



LAS Series



DLC Series



TC Series



HPC Series

