



Cutting Tools & Mold Coating Equipment

We have independent intellectual property rights of HUASHENG nanotechnology+

Provide you with PVD coating equipment solutions

Guangdong Huasheng Nanotechnology Co., Ltd



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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 establised 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

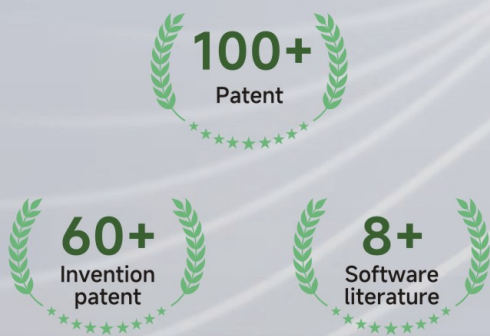


Second Prize of Science and Technology Invention of Guangdong Province in 2021
Dongguan City first (set) key technical equipment project
Guangdong Province famous high-tech products



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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Mechanical coating equipment

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**Breaking the rules
for excellence!**



30 μ m

Smooth
No droplets

2 μ m/h

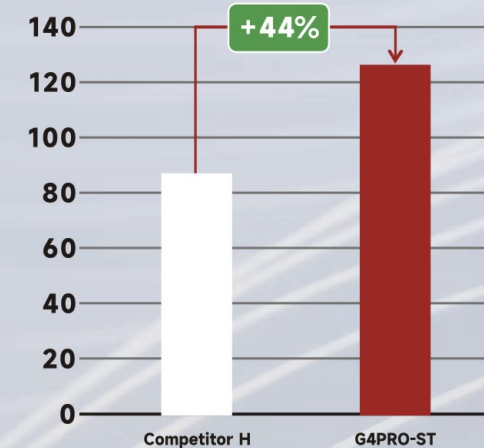
High
ionization
rate

Excellent
Adhesion

G4PRO-TiAlSiN Application case

Case 1: Stainless steel turning

Cutting life/piece



Tool: TNMG160408-BF

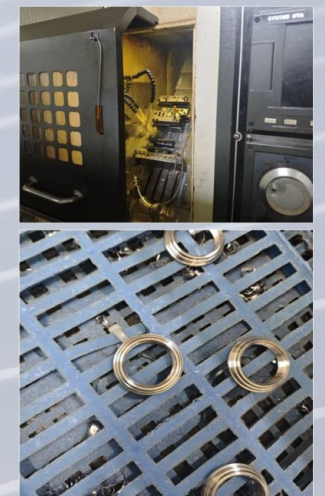
Workpiece: 304(150~180HB)

Cutting Parameters :
Continuous turning of outer circle

- Cutting speed: $V_c = 211\text{m/min}$
- Feed per revolution: $F_n = 0.18\text{mm/r}$
- Cutting depth: $a_p = 1.4\text{mm}$
- Cooling: Emulsion

Result:
The G4PRO-ST coating exhibits a 44% increase in cutting life compared to the competitor H

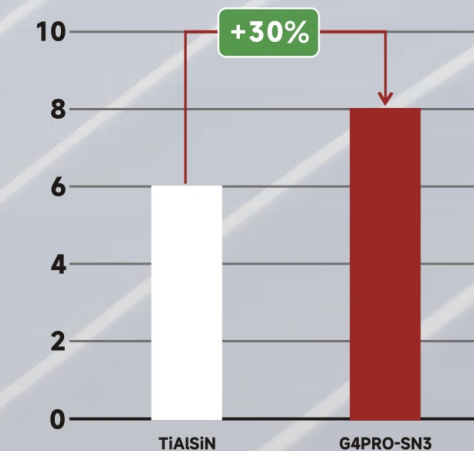
Source: Terminal test cutting



G4PRO-TiAlSiN Application case

Case 2: Milling of high-hardness mold steel

Cutting life/H



Tool: R3

Test bench: Brother (16000)

Workpiece: DC53(~62HRC)

Cutting Parameters:
3D Profile Milling

- Cutting speed $V_c = 170\text{m/s}$
- Feed per tooth $F_z = 1500\text{mm/z}$
- Cutting depth $a_p = 0.03\text{mm}$
- Cutting width $a_e = 0.1\text{mm}$
- Cooling: oil

Test result:
Off Standards: Surface roughness of the workpiece, $R_a > 1\mu\text{m}$
Conclusion Analysis: The SN3 coating exhibits a 30% increase in cutting life compared to the competing AIP-TiAlSiN coating.

Data: Terminal test cutting



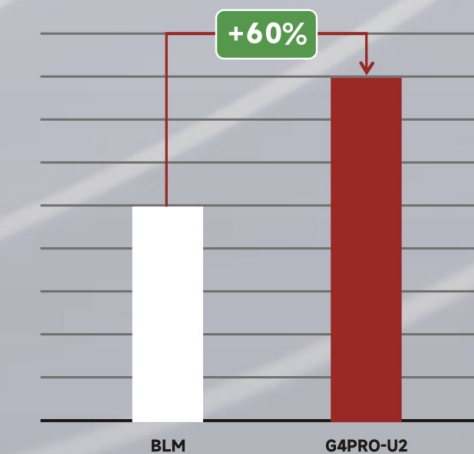
G4PRO-SN3 3h

TiAlSiN 6h

G4PRO-ALTiN Application case

Case 3: Gear milling

Processability



Tool:
LNCX1906-CR3.5
LNCQ190906-CR5

Workpiece: C45

Cutting Data:
External gear milling of port machinery

- Cutting speed $V_c = 120\text{m/min}$
- Feed per tooth $F_n = 90\text{mm/r}$
- Cooling: Air

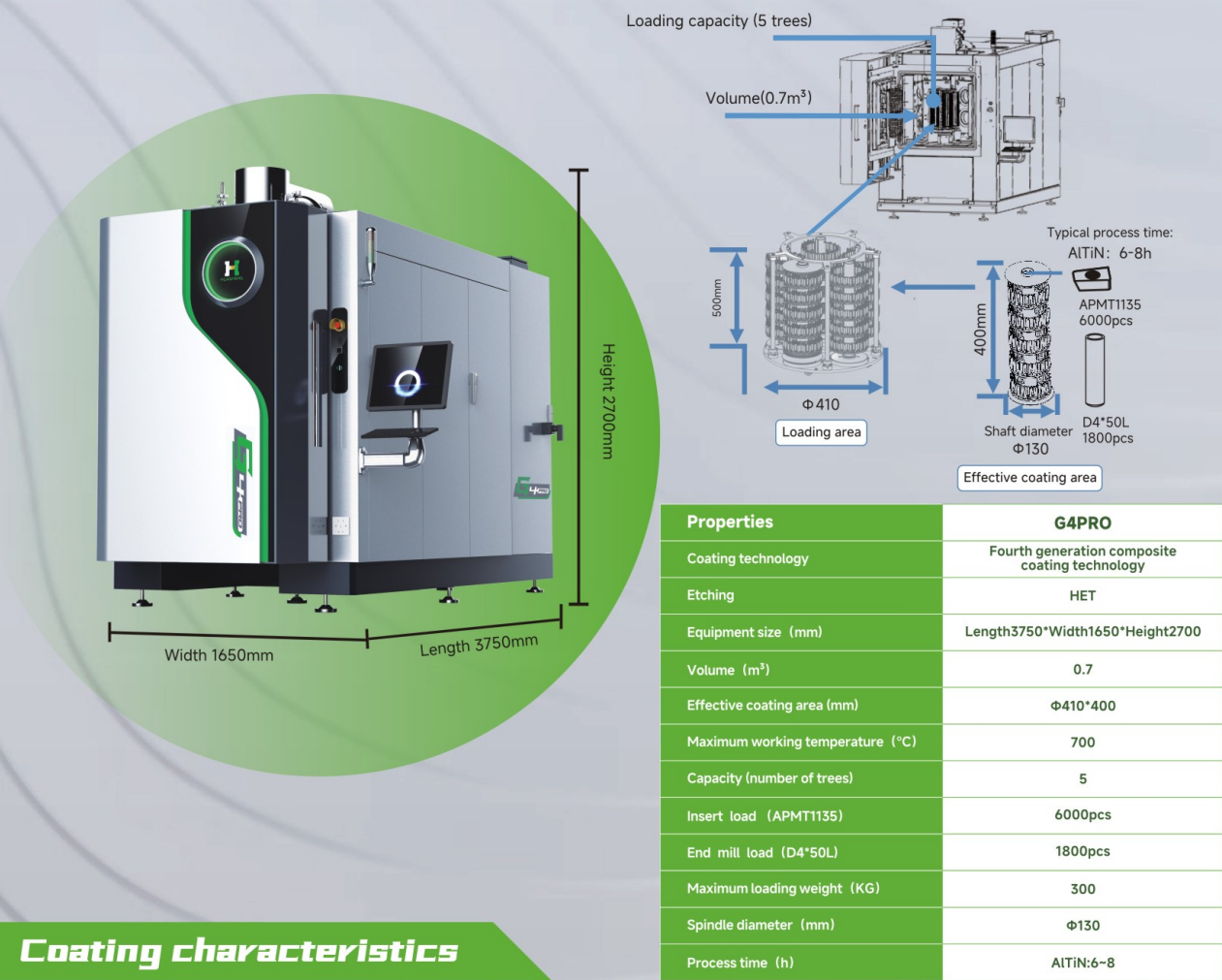
Result:
The tool wears out normally, and its service life is 60% better than BLM coating.

Source: Filed customer

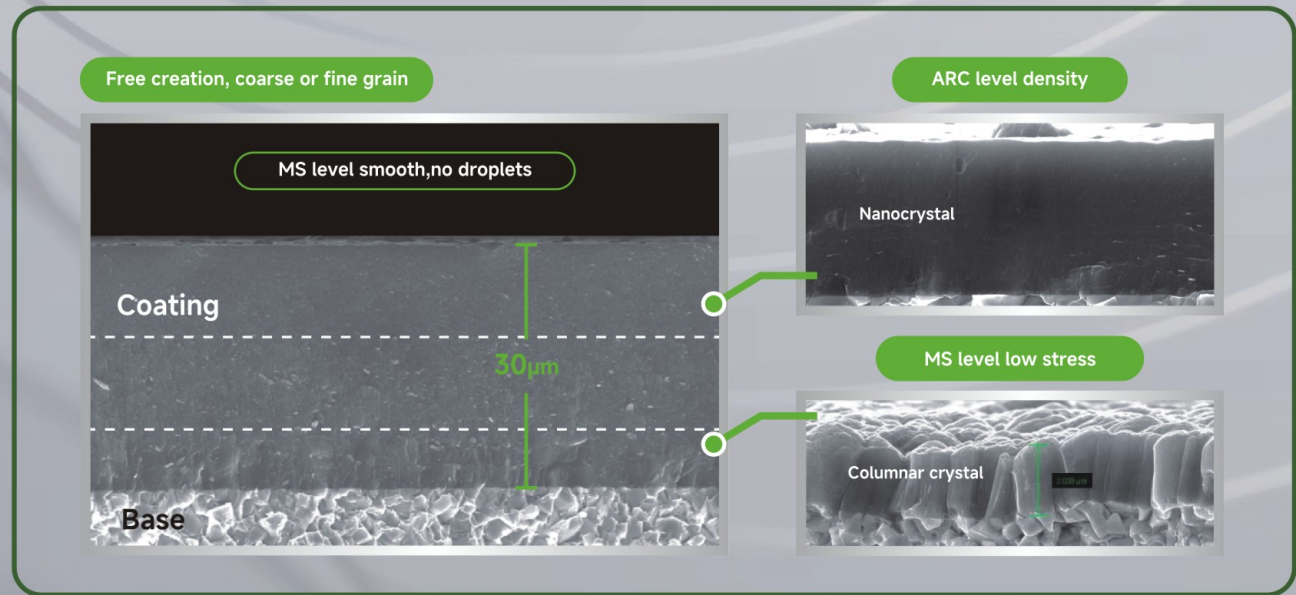


Better quality, less cost

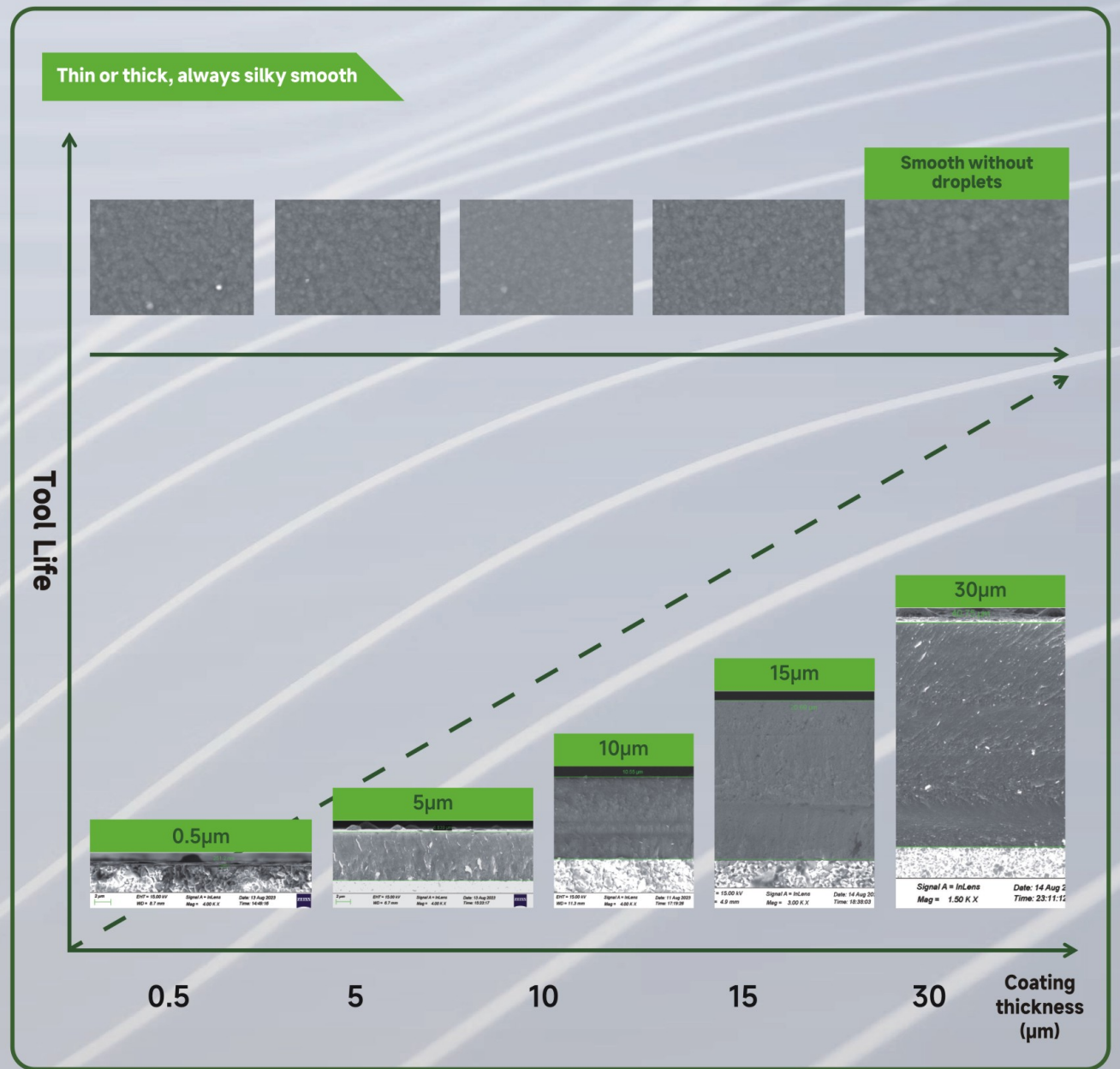
G4PRO adopts brand new 4 targets model, and new controllable plasma technology with high power, adjustable square wave and ionization rate. Thickness is in large range with good surface and adhesion.



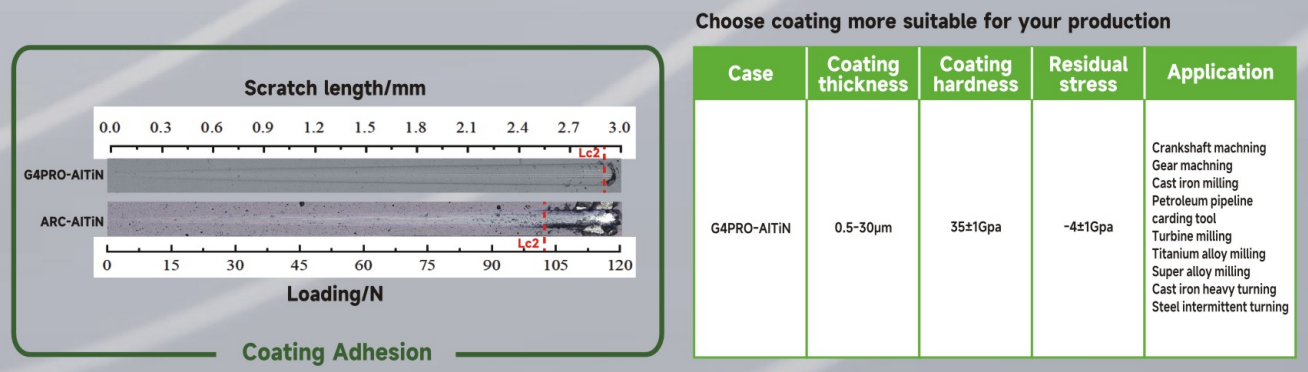
Coating characteristics



All level up Huasheng technology, thick coating with good surface



G4PRO provides coating from 0.5~30μm, covering small edge tools to insert coating application, making tools need no more regrinding.



HA500 Equipment introduction



Integrated Composite Plasma Source

High energy pulsed plasma source with unique pulse modulation technology generates ms level pulsed plasma

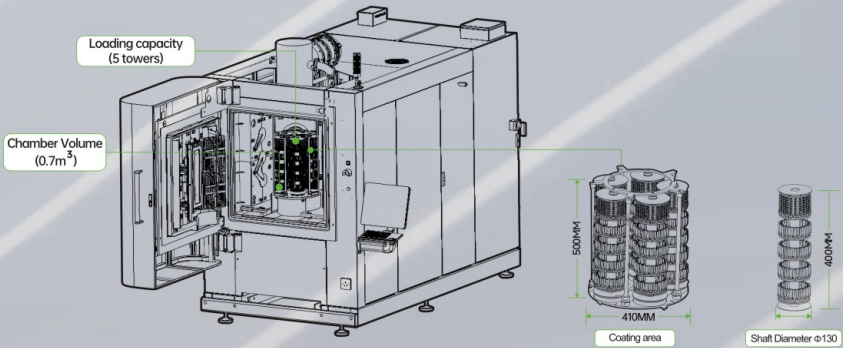
High ionization rate, high deposition rate, no droplet

Deposition of high melting point metals: such as W, Mo, etc

Composite multilayer film (nanocrystal/columnar crystal) deposition, deposition of superlattice nanocrystal and superhard film

HA500 Equipment introduction

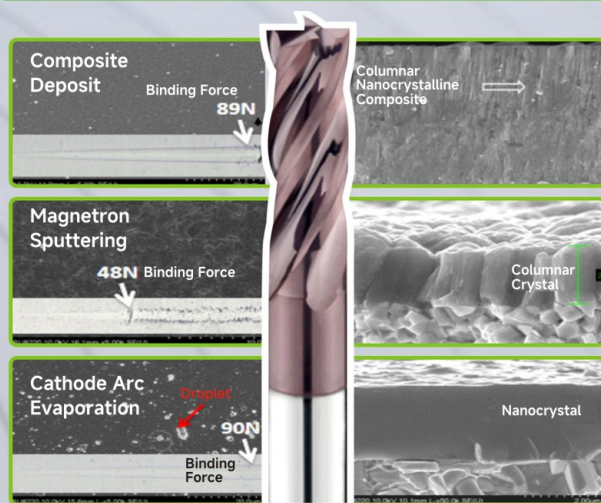
Properties	HA500
Coating technology	The third generation composited coating technology
Etching	The third generation lateral ion source (hot filament)
Arc sources	6
Magnetron Sputtering Source	1
Equipment size (mm)	Length3750*Width1650*Height2700
Volume (m³)	0.7
Coating area (mm)	Φ410*400
Maximum working temperature (°C)	700
Capacity (number of trees)	5
Insert load (APMT1135)	6000pcs
End mill load (D4*50L)	1800pcs
Maximum loading weight (KG)	300
Spindle diameter (mm)	Φ130
Process time (h)	AlTiN: 6-8



HA500 Coatable Products



HA500 Coating characteristics



The integrated cathode realizes the mass production of real nanocomposite multilayer coatings, larger process window and easier coherent growth of superlattice, which can control the internal stress of the film, it can deposit thick film and dense film, and the ionization rate is between HiPIMS and AIP technology;

The pulse length can reach the order of ms, which can maintain high plasma density for a long time and make the coating denser

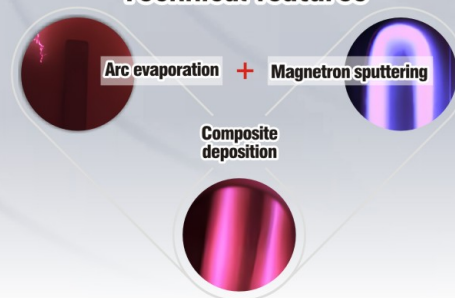
The internal stress maintains the low stress of magnetron sputtering, and the stress value is less than -2GPa

The deposition speed is faster, and the coating thickness can reach more than 10 μm

No droplets on the surface, better surface finish, smoother chip removal

High-gloss ceramic phase film deposition improves the anti-sticking property of the coating and is more suitable for alloy processing

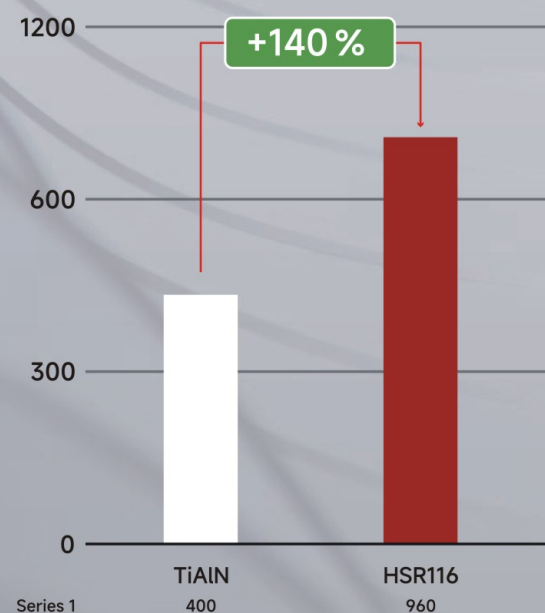
Technical features



Application case

Case 1: HSR116

Tool life



Tool:
• D6R0.3*H15*D6*50L*4F

Workpiece:
• TC4 (Ti6Al4V) • 30HRC

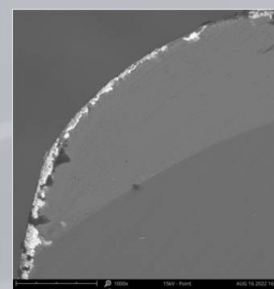
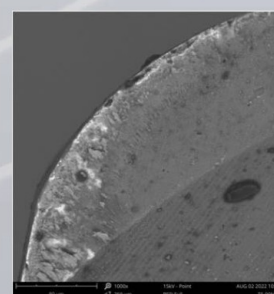
Cutting data:

- $V_c = 115\text{m/min}$ S6100
- $F_z = 0.038\text{mm}$ F900
- $a_p = 8\text{mm}$
- $a_e = 0.05\text{mm}$
- Cooling: Oil

Result:

HSR116 increased tool life by 140% than TiAlN

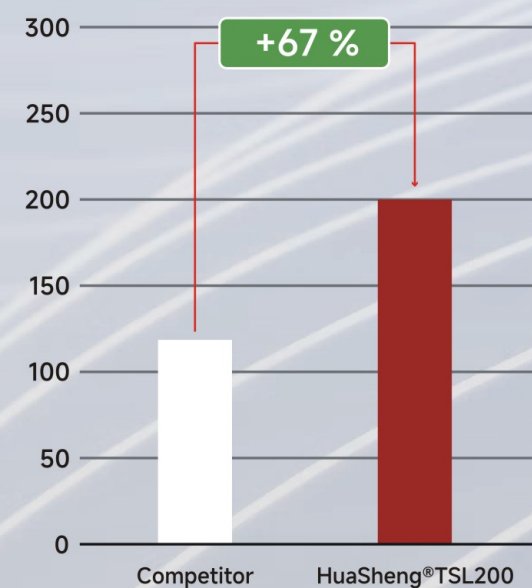
Source: Huasheng cutting center



HuaSheng® TSL200

Case 1: Stainless steel

Tool life/min



Tool:

• D6R0.3XH10XD6XL75XF4

Workpiece:

• SUS316L (HB150-187) 022Cr17Ni12Mo2

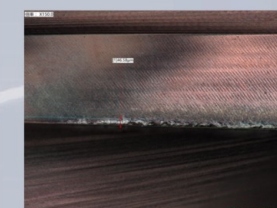
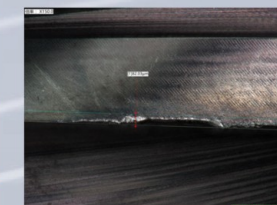
Cutting data:

- $V_c = 169\text{m/min}$
- $F_z = 0.08\text{mm/min}$
- $a_p = 6\text{mm}$
- $a_e = 0.35\text{mm}$
- Cooling: Oil

Result:

- Competitor can machine 120min
- TSL200 can machine 200min
- Tool life is increased by 67%

Source: Huasheng cutting center

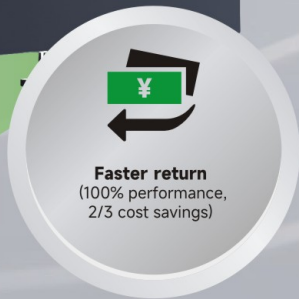
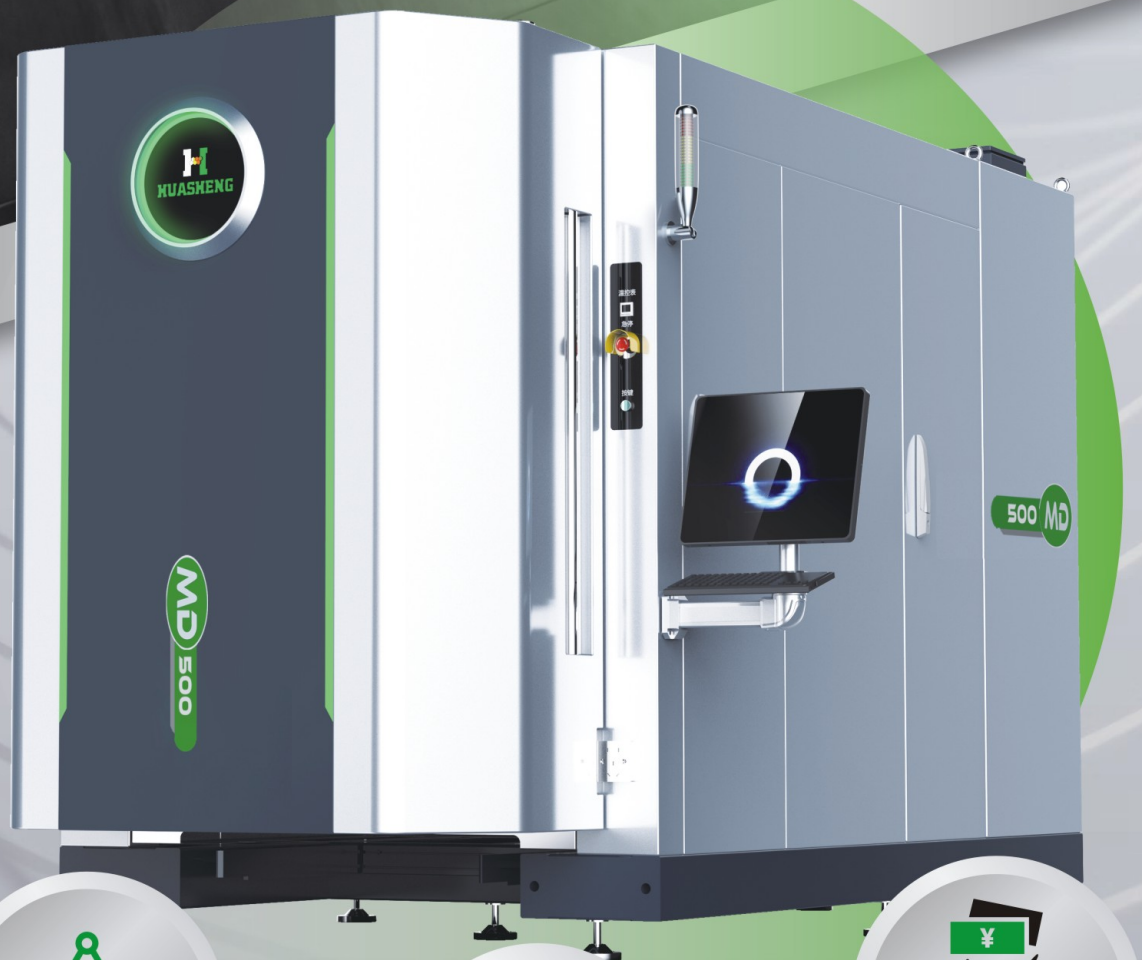


customizable



Huasheng MD series Coating equipment for cutting tools

Super value choice MD500



HuaSheng® Turnkey solution

Huasheng® turnkey solution is suitable for tool manufacturing and regrinding processes. We can customize coating centers and own flexible production system to customize high-quality coatings, integrated supply and demand. Our turnkey solution adapted to various applications, with unique advantages for you.



Always full batch
Controllable quality



Exclusive
coating



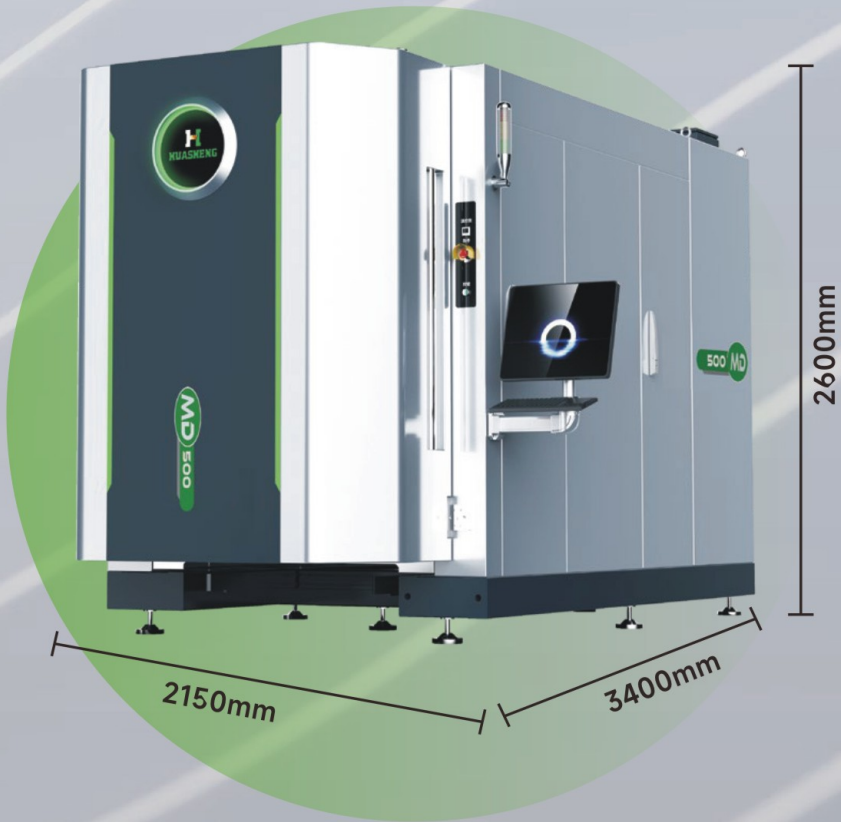
Independent
developed



Customized
individually

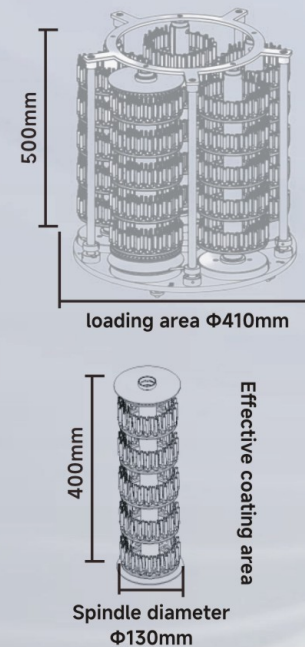


Fast return



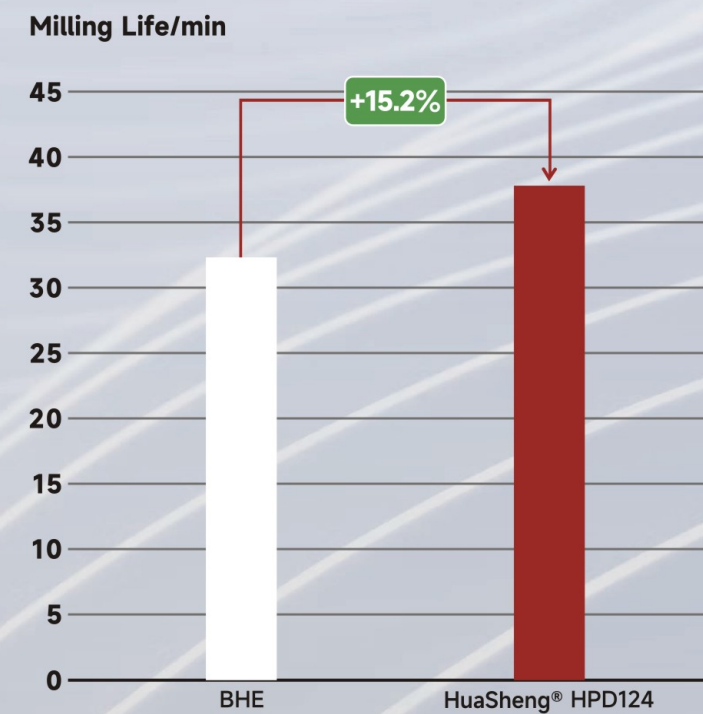
MD500 Equipment Parameter

Properties	MD500
Coating technology	Arc
Etching	WET
Arc sources	6
Volume (m³)	0.7
Effective coating area (mm)	Φ410*400
Maximum working temperature (°C)	600
Power (kW)	150
Capacity (number of trees)	5
Insert load (APMT1135)	6000pcs
End mill load (D4*50L)	1800pcs
Hobbing tool load (D80*L150)	/
Maximum loading weight (KG)	300
Spindle diameter (mm)	Φ130
Process time (h)	AlTiN:6~8



HuaSheng® HPD124 Drilling Performance

Case: Stainless steel(304) drilling



Tool data: D6*82

Workpiece:
stainless steel 304(HB200)

- GB: 06Cr19Ni10
- JIS: SUS304

Cutting data: Blind Hole Drilling

- Cutting speed Vc = 30m/min
- Feeding Fn = 0.1mm/r
- Cooling: water

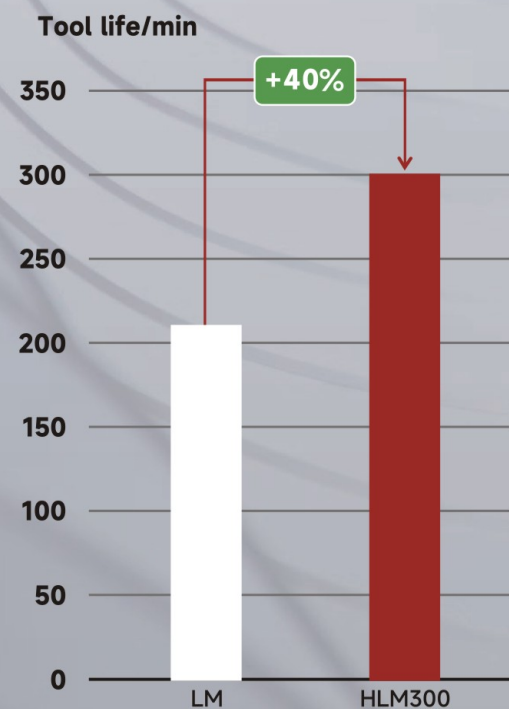
Result:

- Huasheng's HPD124 coated tool can achieve a cutting life of 38 meters
- The coated tool from competitor BHE offers a cutting life of 33 meters
- The cutting life has been improved by 15.2%

Resource: Huasheng cutting center

HuaSheng® HLM300 Milling performance

Case: Carbon Steel (P20) Milling



Tool data: OMPQ-4E-100

Workpiece: P20 HRC32

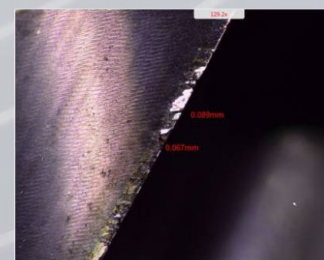
Cutting data

- Processing: Milling - Slotting
- Cutting speed Vc = 110m/min
- Feeding Fz = 0.04mm
- Cutting depth ap = 3mm
- Cutting width ae = 10mm
- Cooling: Cutting fluid

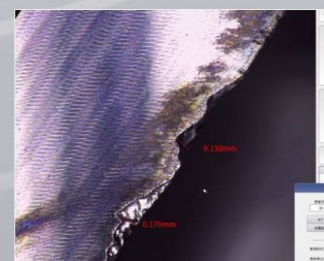
Result:

- Tool removal:**
flank wear width Vb ≥ 0.08mm
- The HLM300 coated tool can process for 300 minutes, while the competing coated tool can only process for 220 minutes
 - Additionally, the HLM300 coating exhibits less wear and the cutting edge remains more intact

Resource: Terminal Laboratory



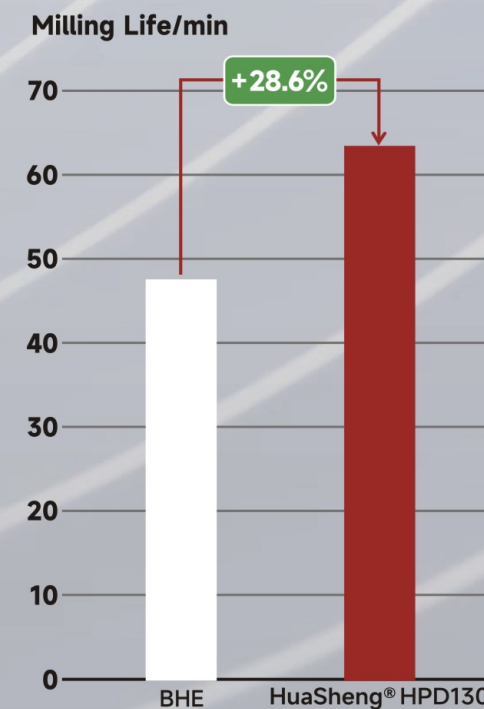
HLM300-300min wear



LM-220min wear

HuaSheng® HPD130 Drilling Performance

Case: Alloy Steel (42CrMo) Drilling



Tool data: D5.1*28*D6*66

Workpiece:
42CrMo steel(38-42HRC)

- GB: 2CrMo
- ASME: 4140
- JIS: SCM440

Cutting data:
Blind Hole Drilling

- Cutting speed Vc = 70m/min
- Feeding Fn = 0.15mm/r
- Cooling: External cooling, Emulsion

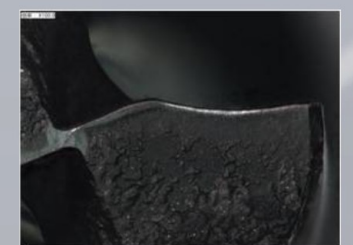
Result:

- NG: Rear flank wear Vb ≥ 0.08mm**
- Huasheng's HPD130 coated tool can achieve a cutting life of 63 meters
 - The coated tool from competitor BHE offers a cutting life of 49 meters
 - The cutting life has been improved by 28.6%

Resource: Huasheng cutting center



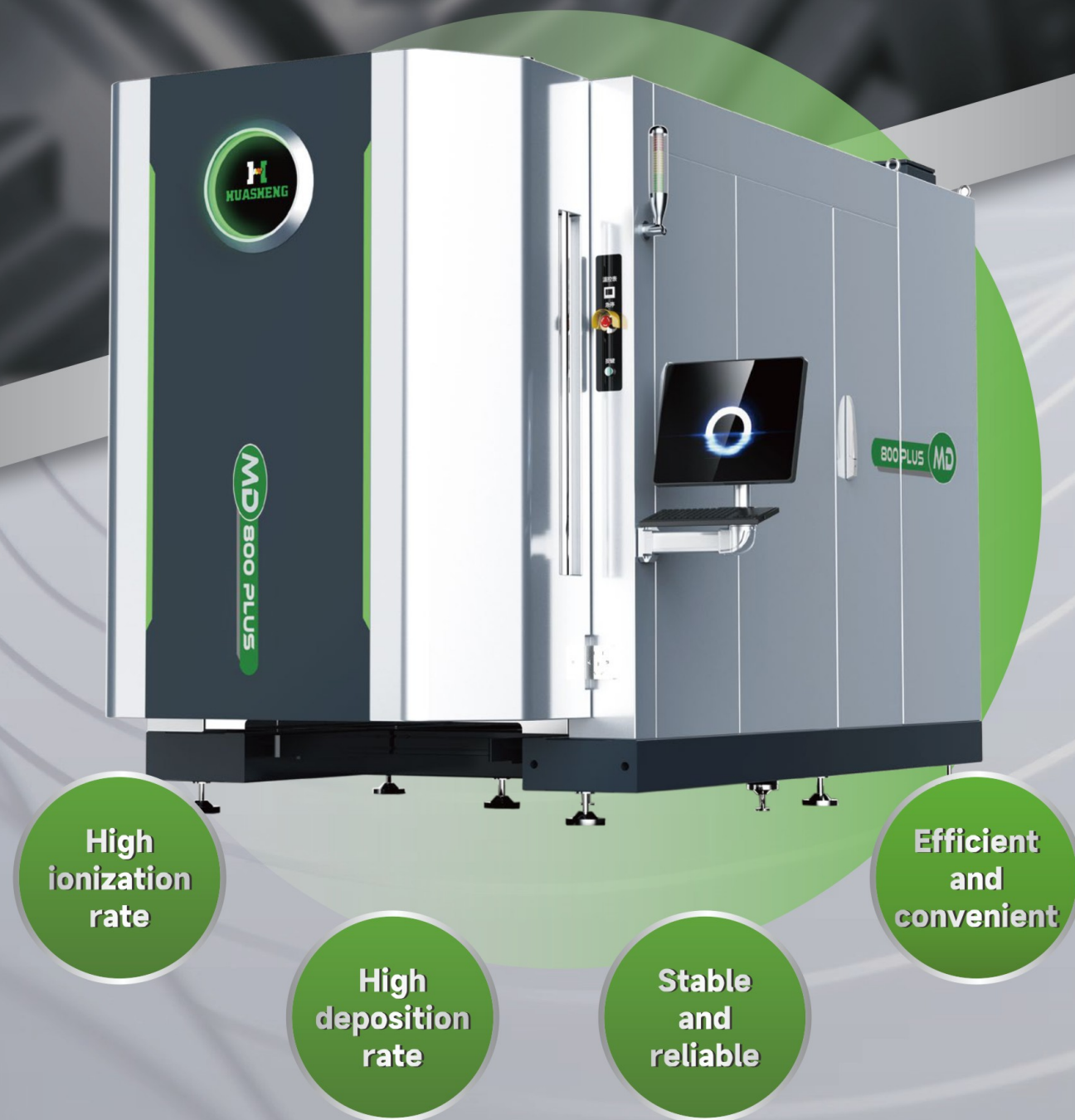
45m wear-HPD130



45m wear-BHE

Super value choice MD800 Plus

Enjoy superior performance at a shocking price and triple the satisfaction!



HuaSheng® coating equipment turnkey solution

Huasheng's turnkey coating equipment solution can be quickly integrated into your tool manufacturing and grinding manufacturing processes, effectly saving your time.

Independence

Independent from coating service providers, we has own turnkey coating equipment system. Independently control the entire production process. Independent coating technology can completely preserve interiorly, giving you more peace of mind!

Personalized customization

Huasheng's equipment can be customized. Open source technology allows you to develop your own coatings, Independently control the entire development process. For your high demand for new technologies and innovations in PVD coatings, provide strong support and competitive potency!

Fast delivery

The entire coating process can be completed on the same day. The interior ensures the shortest production process route and avoids damage during transportation or packaging. The production is efficient and environmentally friendly, saving time and effort!

Wide range of application industries

The coating center mixes different tools for coating. The equipment is designed for a universal process flow. However, the coating thickness and quality can be specifically set. Huasheng has a wide range of flexible coating types, suitable for various tool/part geometries and various industries.

MD Series Equipment Introduction

MD series equipment adopts Huasheng's new lateral etching technology and multi-arc ionplating to achieve high ionization rate arc plasma coating technology.

The films prepared by it have wide versatility and have a greatly improved service life in steel milling, stainless steel turning, etc. Improvement, high reliability of equipment and stability of process make coating production simpler and more efficient.

Arc deposition, optimal performance!

New arc coating technology, high deposition rate and denser coating!

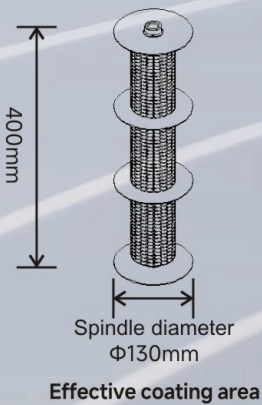
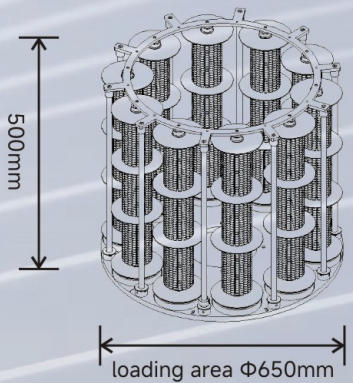
Ultra-high impact resistance, high ionization rate, and better adhesion!

New etching technology, even plating around is better, maintaining quality consistency!

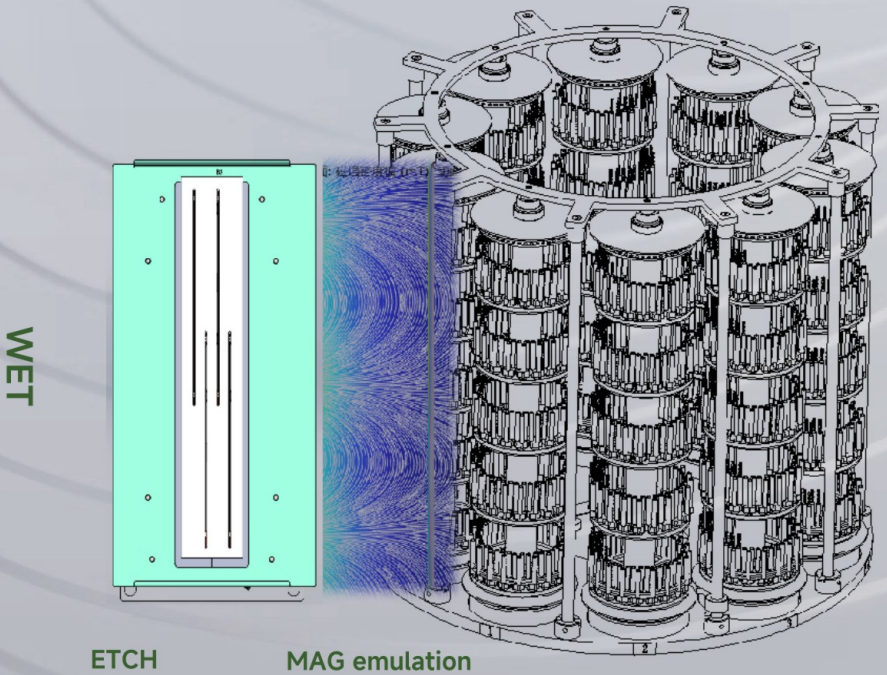
Fully automated operation, efficient and convenient operation, high batch production capacity, the king of cost performance!

MD Series equipment parameters

Properties	MD800 Plus
Coating technology	Arc
Etching	WET
Arc sources	8
Volume (m³)	1
Effective coating area (mm)	Φ650*400
Maximum working temperature (°C)	600
Power (KW)	200
Capacity (number of trees)	10
Insert load (APMT1135)	12000pcs
End mill load (D4*50L)	3600pcs
Hobbing tool load (D80*L150)	30pcs
Maximum loading weight (KG)	500
Spindle diameter (mm)	Φ130
Process time (h)	AITN:6-8



Features of Huasheng's new side etching technology



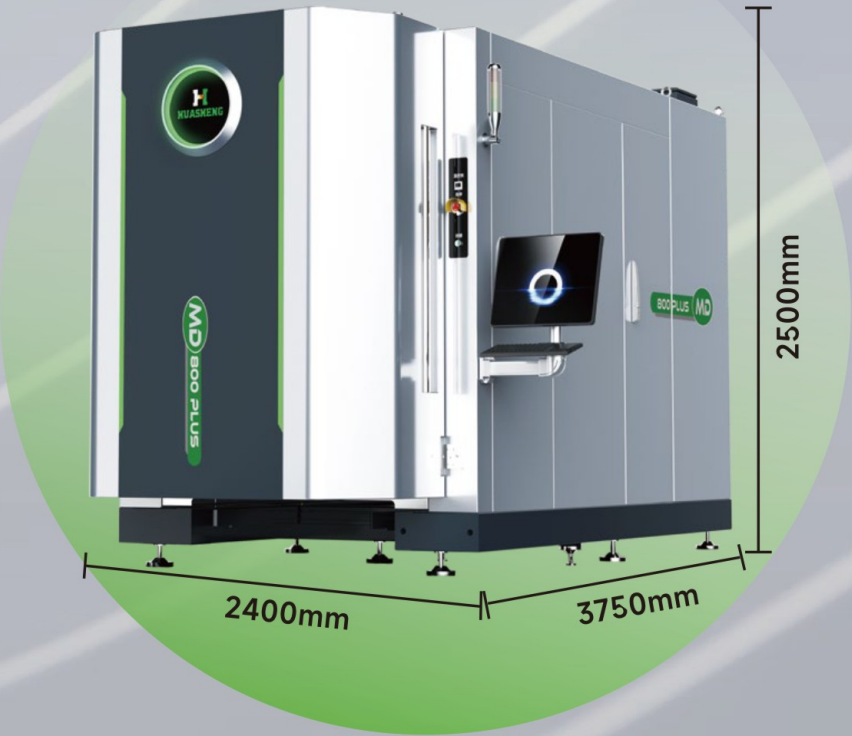
The magnetic field evenly surrounds the entire workpiece holder

Excellent etching uniformity

Excellent etching and diffraction properties

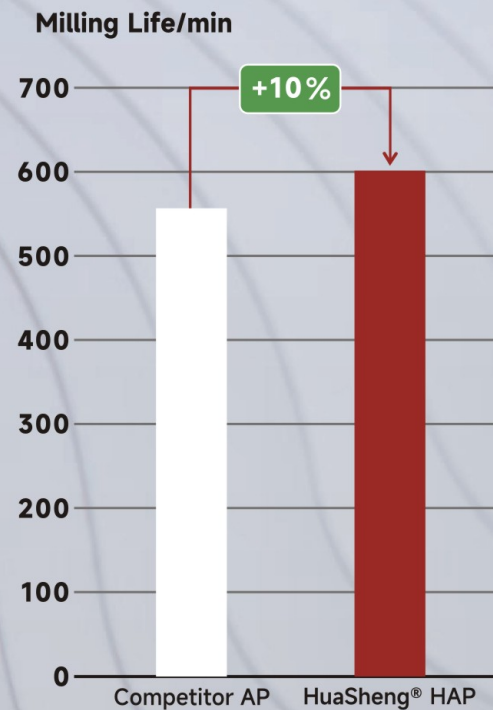
Etching intensity is adjustable

Maintenance-free etching module



HuaSheng® HPR125 Milling performance

Case : Carbon Steel (P20) Milling



Tool data:
D6R3*50 球刀 OKE 800#

Workpiece:
• P20(35-37 HRC)

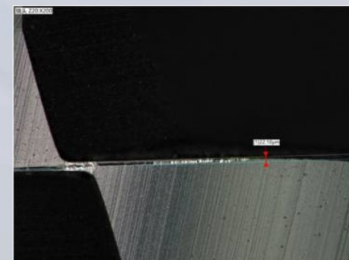
Cutting data: milling

- Cutting speed $V_c = 188.4\text{m/min}$
- Feeding $F_z = 0.15\text{mm}$
- Cutting depth $a_p = 0.1\text{mm}$
- Cutting width $a_e = 0.12\text{mm}$
- Cooling: water

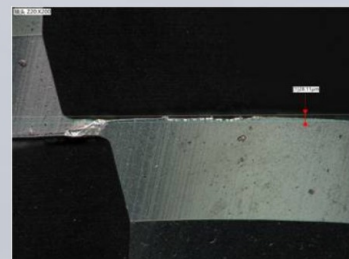
Result:

- Evaluation Standard: Compare the width of the wear land on the flank face.
- HuaSheng HPR125 coated tool machined 600 min
 - AP coated tool machined 550 min
 - 10% increase in cutting life

Resource: Huasheng cutting center



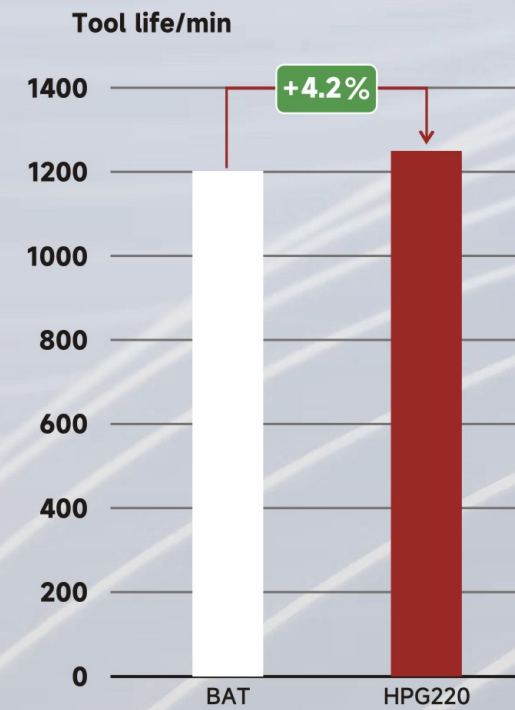
300min wear(22.1 μm)-HPR125



300min wear(28.11 μm)-AP

HuaSheng® HPG220 Gear Processing Performance

Case: Hobbing high-speed gear processing



Tool specifications:
G90 180×80 hobbing cutter

Material to be processed:
• 20CrMoTi(48-60HRC)

Test conditions: hobbing

- Cutting speed $V_c = 250\text{m/min}$
- Cooling method: dry cold

Working criteria:

Gear tooth surface not conforming to standards/1200 PCS

Test Results:

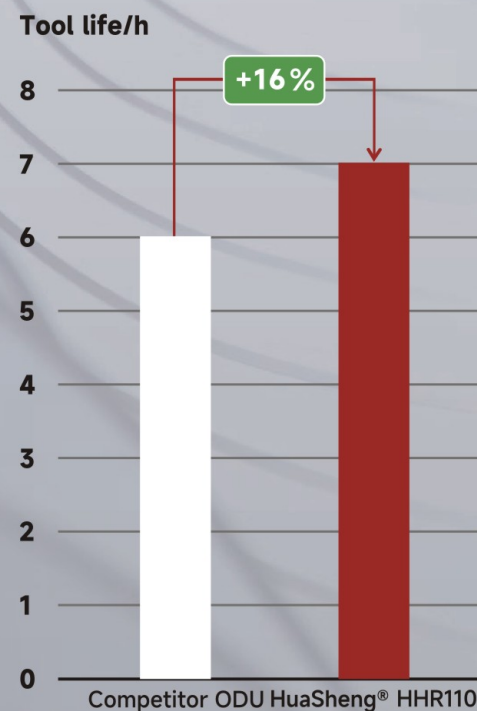
BAT's Ultimate Life: 1200PCS
HPG220's Ultimate Life: 1250PCS
Increase of 4.2%

Resource: terminal data



HuaSheng® HHR110 Milling performance

Case: Tool steel (SKH-9) Milling



Tool data: D4R2

Workpiece:
• SKH-9 (58-62HRC)

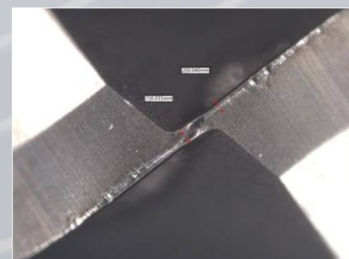
Cutting data: side milling

- Cutting speed $V_c = 126\text{m/min}$
- Feeding $F_z = 0.15\text{mm/z}$
- Cutting depth $a_p = 0.04\text{mm}$
- Cutting width $a_e = 0.1\text{mm}$
- Cooling: Air

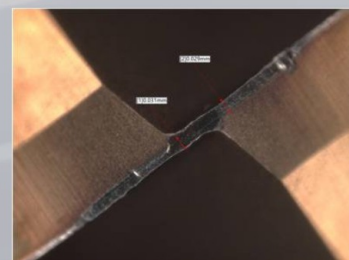
Result:

- Tool removal: The surface roughness of the workpiece $R_a > 0.8\text{ }\mu\text{m}$
- After 7 hours of cutting with the HuaSheng HHR110 coated tool, the rear flank wear is 0.031mm
 - After 6 hours of cutting with the competitor's coated tool, the flank wear is 0.035mm
 - The HHR110 exhibits less and more uniform wear compared to competing products

Resource: Terminal Laboratory



300min wear-ODU



300min wear-HHR110



customizable

DA600PRO

Diamond Coating Equipment

Deposition Method: Hot Filament CVD



4-30um

1.0um/h

High
Stability

800pcs
/batch
D3.175

DA600PRO Characteristics of diamond coating equipment

High deposition rate: Max 1.0um/h

Widerange of film thickness: 4-30um

The double-layer water-cooling structure and the uniform temperature field can ensure the synthesis of ultra-nanocrystalline, nanocrystalline, and microcrystalline diamonds with various thicknesses and large areas.

The hot-filament technology exhibits a low failure rate and high equipment stability.

High power and high loading capacity ensure that the equipment can efficiently produce coatings with high quality. (800pcs/furnace; D3.175)

It can meet the application needs in multiple fields, such as composite materials, graphite, PCB ceramic substrates, AlSi alloys (Si>12%), CFRP, woodworking, and other complex working conditions.

Good uniformity of film thickness: The difference in film thickness between the rake face and the flank face of the coated tool is less than 15%; More areas of the tool can be coated, and it has higher compatibility.

Feature introduction

The diamond equipment DA600PRO innovatively developed by Huasheng, utilizes a hot-filament array with a parallel layout, resulting in uniform temperature distribution. The equipment operates stably and reliably for extended periods, is fully automated, and can store multiple process recipes to accommodate various application needs.

Pre-processing

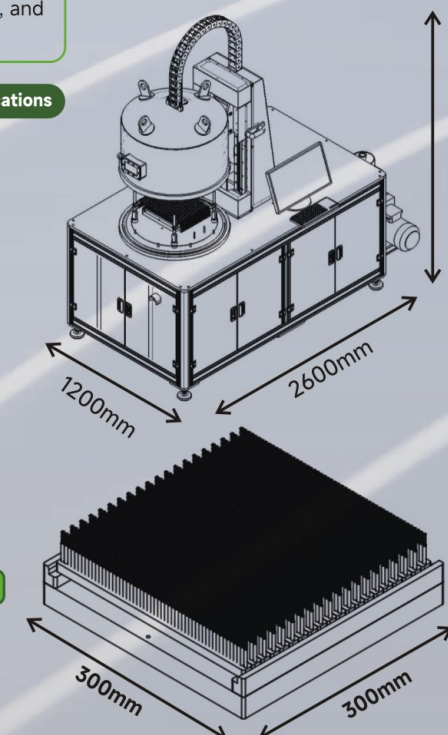
High coating performance

Multi-process formula

Multiple applications

Equipment description

Properties	DA600PRO
Coating technology	HFCVD
Equipment size(mm)	Length2600*Width1200*Height2700
Volume(m³)	0.16
Coating area(mm)	300*300
Maximum size of end mill(mm)	D16*150
Loading capacity(D3)	500pcs
Process time(h)	16-33



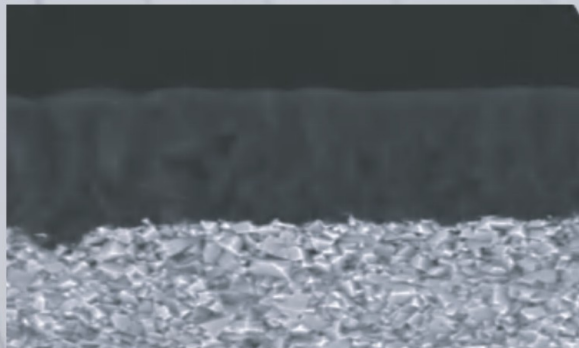
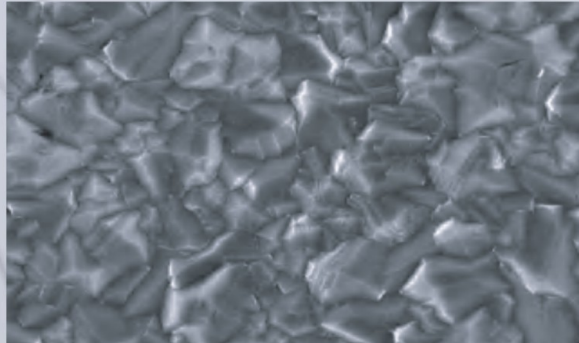
CVD Application range of diamond coating

Carbon-based materials	Graphite, composites, carbon fiber reinforced plastic/graphite, laminated carbon fiber
Non-ferrous metals	AlSi alloy (bis zu 20%Si), synthetic metal template (MMC), magnesium, copper alloy, titanium, brass, precious metals
Other non-metallic materials	Glass fiber reinforced plastics, composite materials (e.g. Al-KFK-Al), green ceramics, ceramics, mineral fiber reinforced plastics
Wood based materials	Natural wood, chipboard with or without ceramic, plastic plywood

HuaSheng® HGR410

HuaSheng® HGR410

Graphite processing, dental denture processing, ceramic processing



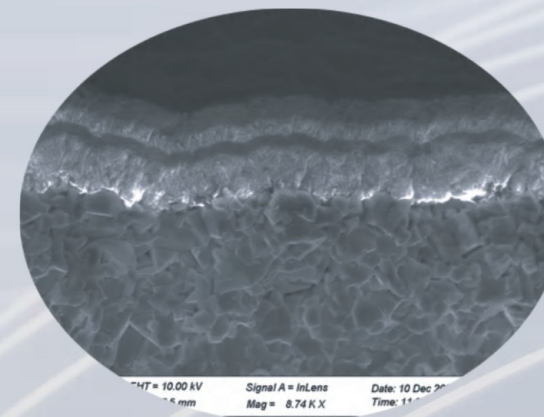
Properties	HGR410
Coating color	Gloss black
Coating thickness(μm)	9±1
Coating hardness HIT (GPa)	80-100
Friction coefficient	0.2
Coating temperature(°C)	> 500
Antioxidant temperature (°C)	650

Coating Structure	Coating performance
Adjust gas composition and chamber pressure	Diamond with high crystal quality achieves higher wear resistance and better bonding performance
Optimize fine grains	Reduce the roughness of the tool surface and have better applications in products with high roughness requirements.

HuaSheng® HFR410 Coating introduction

HuaSheng® HFR410

High guide plate processing, composite material processing, carbon fiber processing

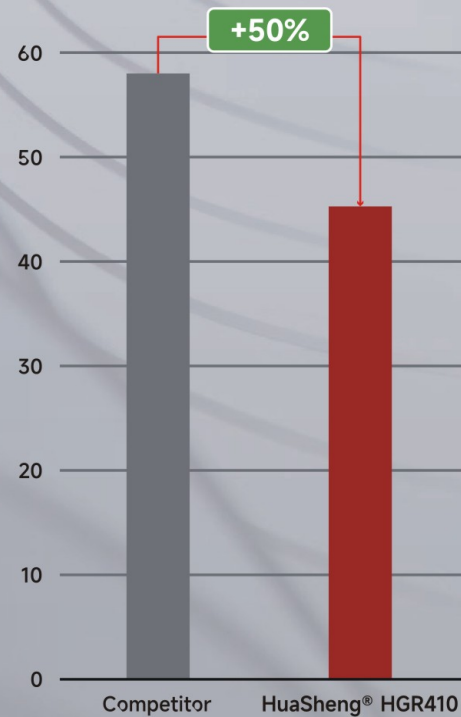


Properties	HFR410
Coating color	Gloss black
Coating thickness(μm)	10±2
Coating hardness HIT (GPa)	80-100
Friction coefficient	0.2
Coating temperature(°C)	> 500
Antioxidant temperature (°C)	650

Coating Structure	Coating performance
Adjust gas composition and optimize coarse crystal orientation	Diamond with high crystal quality achieves higher wear resistance and better bonding performance
Optimize the multilayer ratio of thick and fine crystal films	Improved impact resistance and longer service life in composite material processing

Donghai graphite HK-75

Flank wear value/um



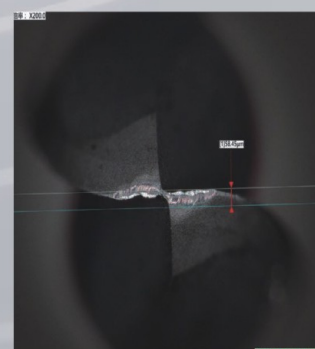
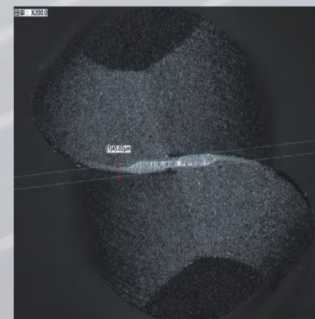
Tool :
Ball End Mill D1.5R 0.75*8*D4*50L*2F

Workpiece:
Donghai graphite HK-75
Hardness: 72HS (51HRC)

Cutting Parameters:
side milling rough machining
Cutting speed Vc = 105m/min
Feed per tooth Fz = 0.068mm
Cutting depth ap = 0.03mm
Cutting width ae = 0.035mm
Cooling method: air cooling
Testing machine: external
Weifeng precision machine

Test result:
1. The edge wear of HGR410 tool is 45.02um,
2. The cutting edge wear of manufacturer k's tool is 58.45um, and there is chipping.

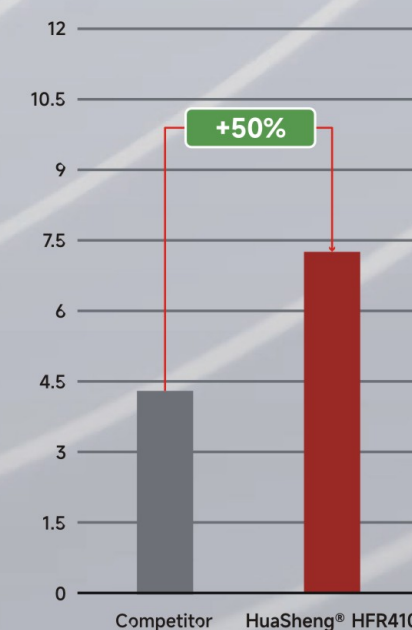
Source: external vendors



58.45um wear chart manufacturer K

HuaSheng® HFR410Coating case introduction

Tool Life/meters



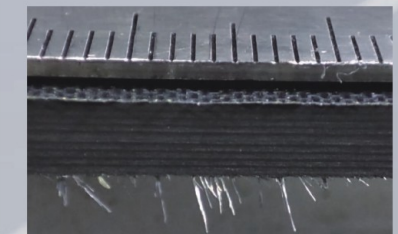
Tools:
D6*20*100*D6

Workpiece:
4mmT800 carbon fiber plate

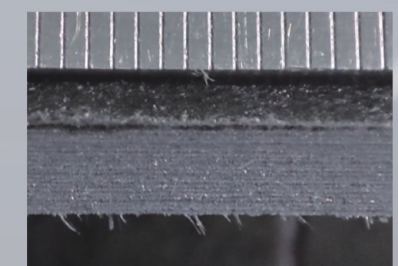
Cutting Parameters:
side milling rough machining
Cutting speed Vc = 150m/min
Milling speed F = 0.6m/min
Cutting depth ae = 3mm
Cooling method: dry milling+cooling

Test result:
Huasheng HFR410 coated tool can process 7.2m;
Manufacturer C's X-coated tool life is 3.6m;
Cutting life increased by 50%

Data source: Terminal Tool Testing Center



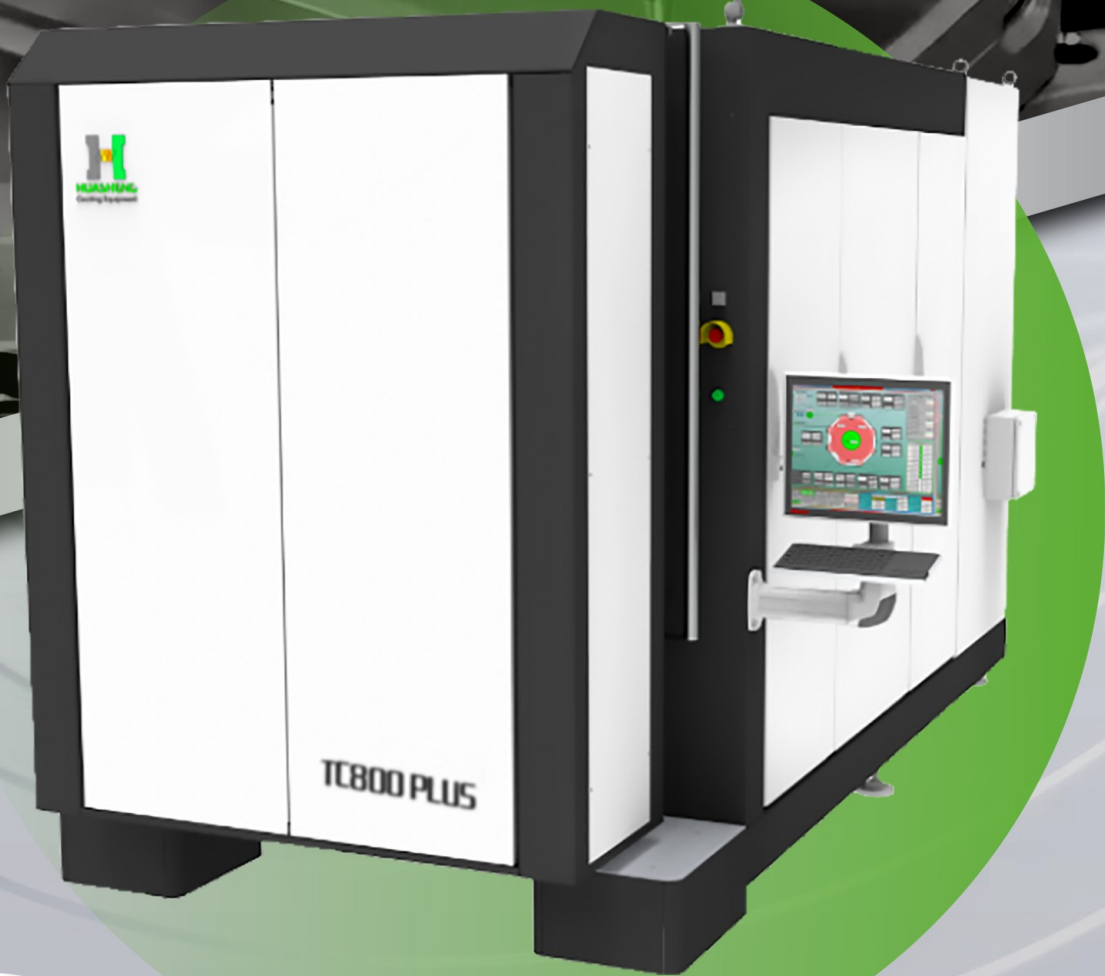
7.2mproduct picture
HFR410



3.6m wear chart
manufacturer C

TC800 Plus

Model Parameter



Flexible automation

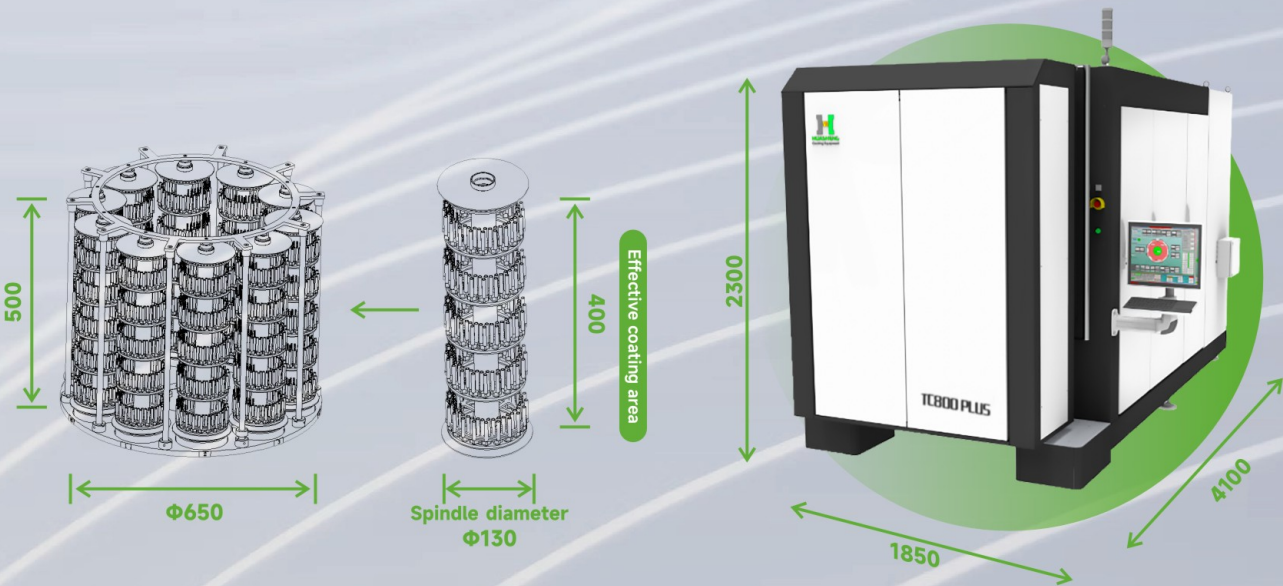
Steady mass production

Low temperature deposition <200°C

Low cost per piece

Equipment introduction

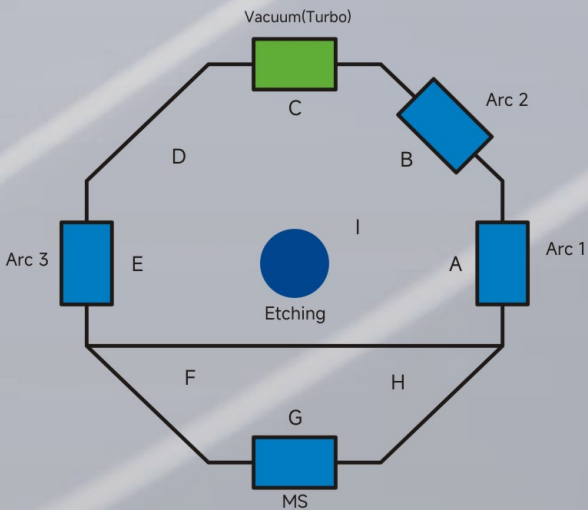
Huasheng independently developed a new composite machine TC800 Plus, which combines the advantages of ion source, magnetron sputtering, and multi-arc ion plating technology to meet different film performance requirements.



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.

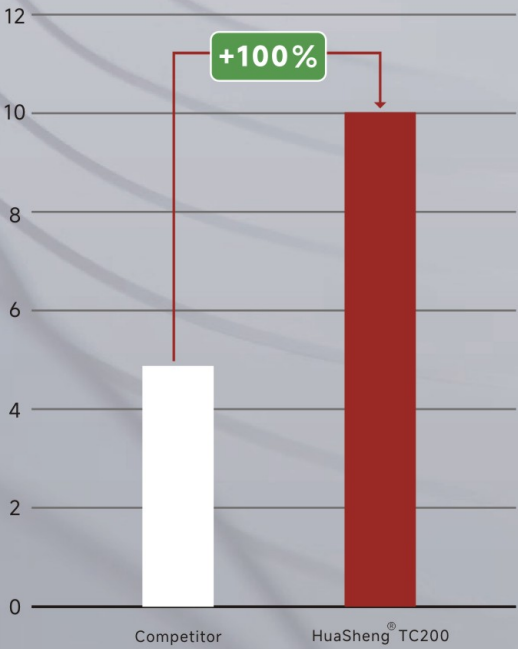
ta-C layer: AIP

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



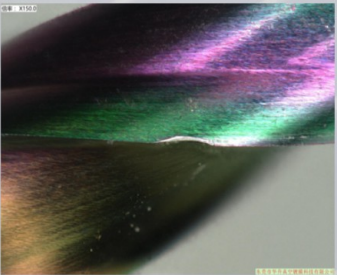
Tools:
1.8*9

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

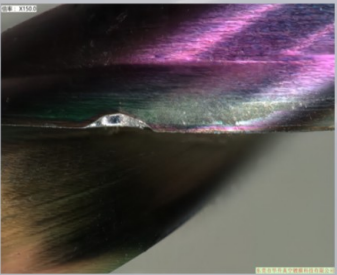
Cutting Parameters:
Cutting speed Vc = 264m/min
Milling speed F = 0.96m/min
Cutting depth ap = 4.8mm
Cooling method: Air cooling

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



10m Wear Chart-TC200



5m Wear Chart-Manufacturer C

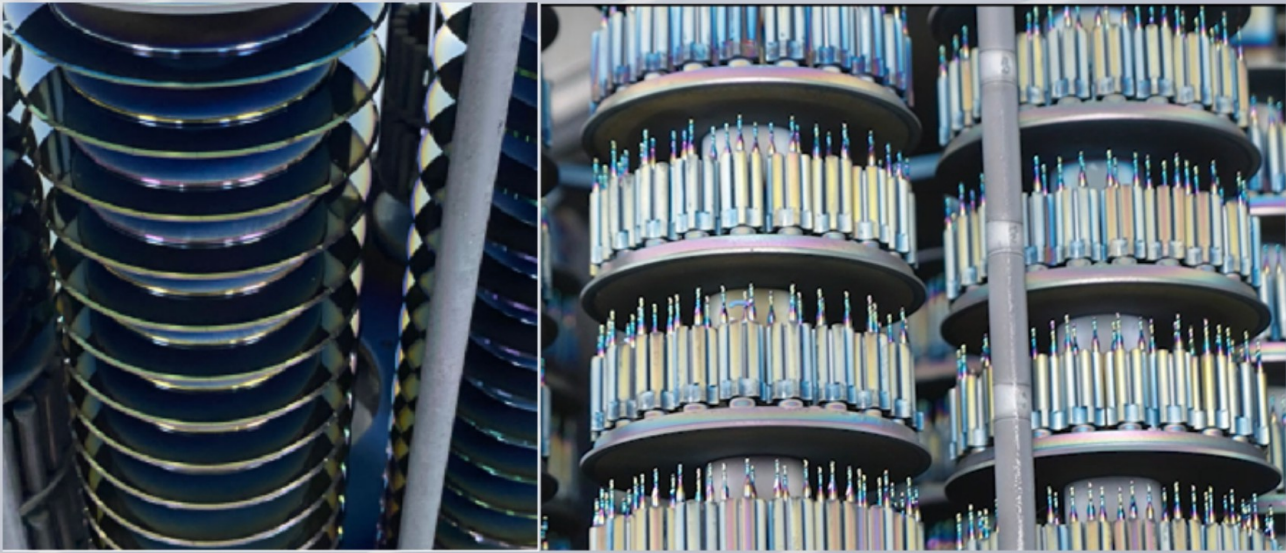
Equipment technology

HUASHENG® TC200- Aluminum alloy processing coating

HuaSheng®TC200

Apply

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

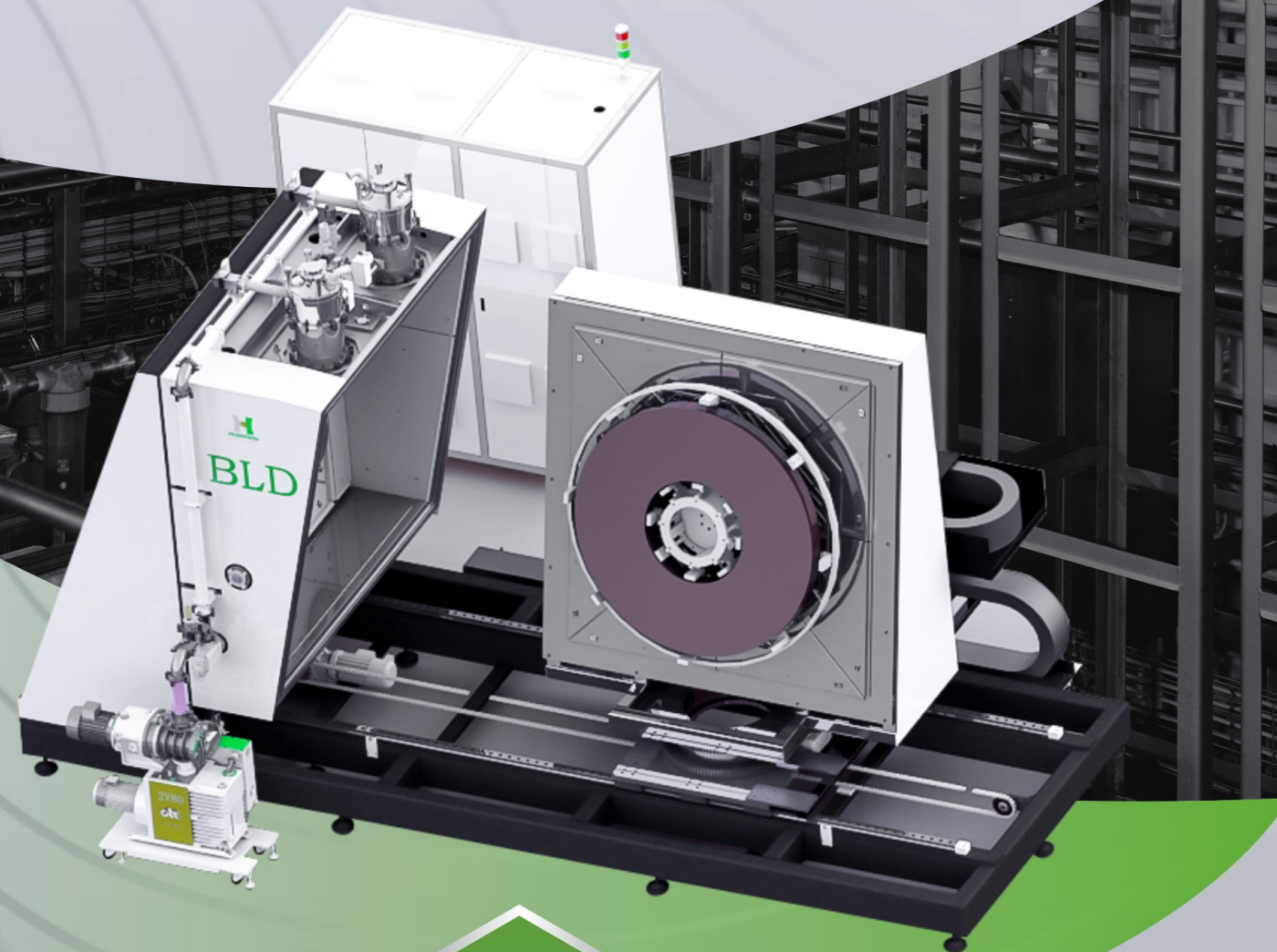


Coating composition	ta-C
Coating color	dazzling
Coating thickness (μm)	0.35±0.05
Coating hardness (Gpa)	> 40
Friction coefficient (dry)	< 0.1
Coating temperature (°C)	< 200
Maximun operating temperature (°C)	< 450

Specialized machine series

Made for customization

Specilized coating equipment for band saw



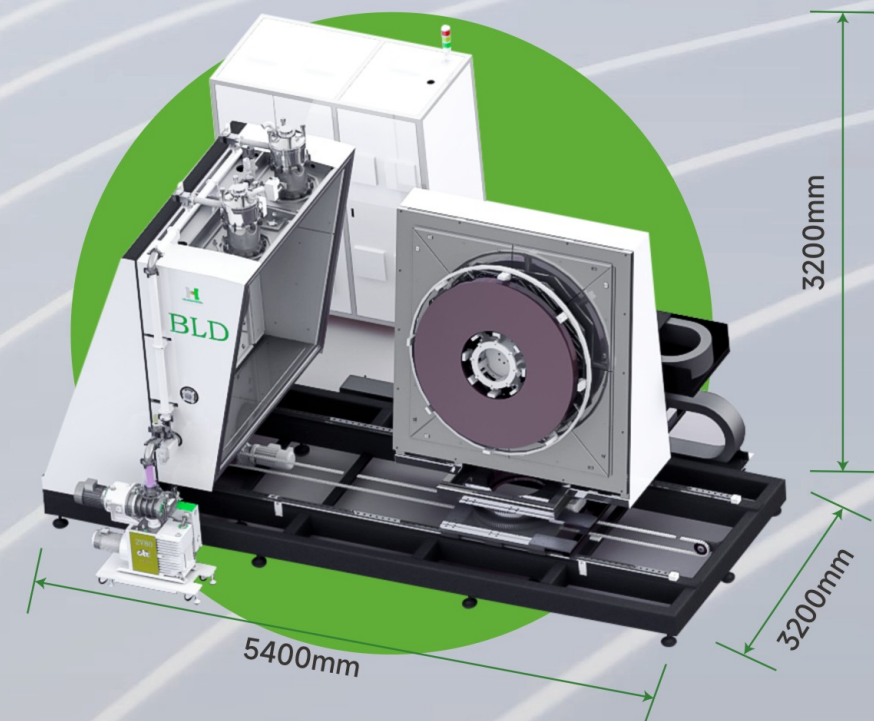
**Uniform
Thickness**
For Each
Gear Wheel

1¥/1m

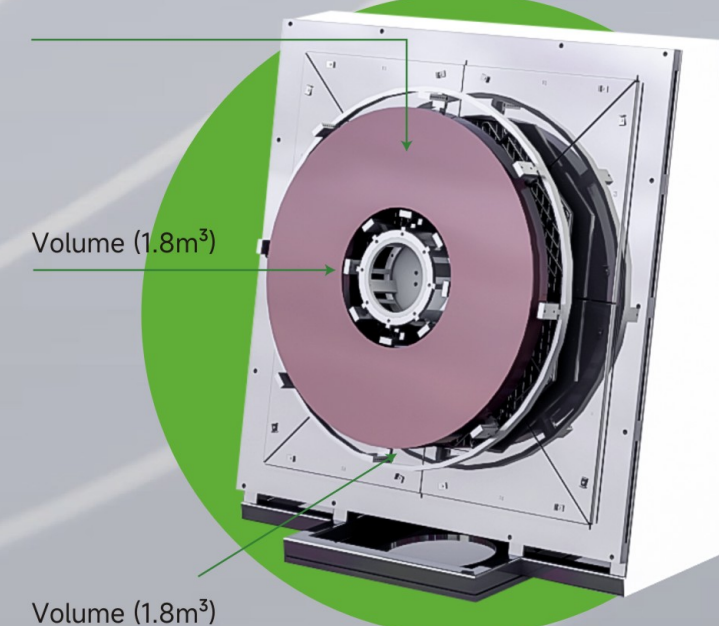
Equipment Introduction

BLD series equipment is Huasheng's brand new PVD coating machine specially used for band saw tool coating. BLD series is equipped with fully automated & intelligent operation. The unique clamping & equipment structure design of BLD empower band saw tool with longer service life and higher cutting efficiency. BLD can be widely applicable for common steel and difficult-to-cut materials: carbon steel, alloy steel, stainless steel, cast iron, etc.

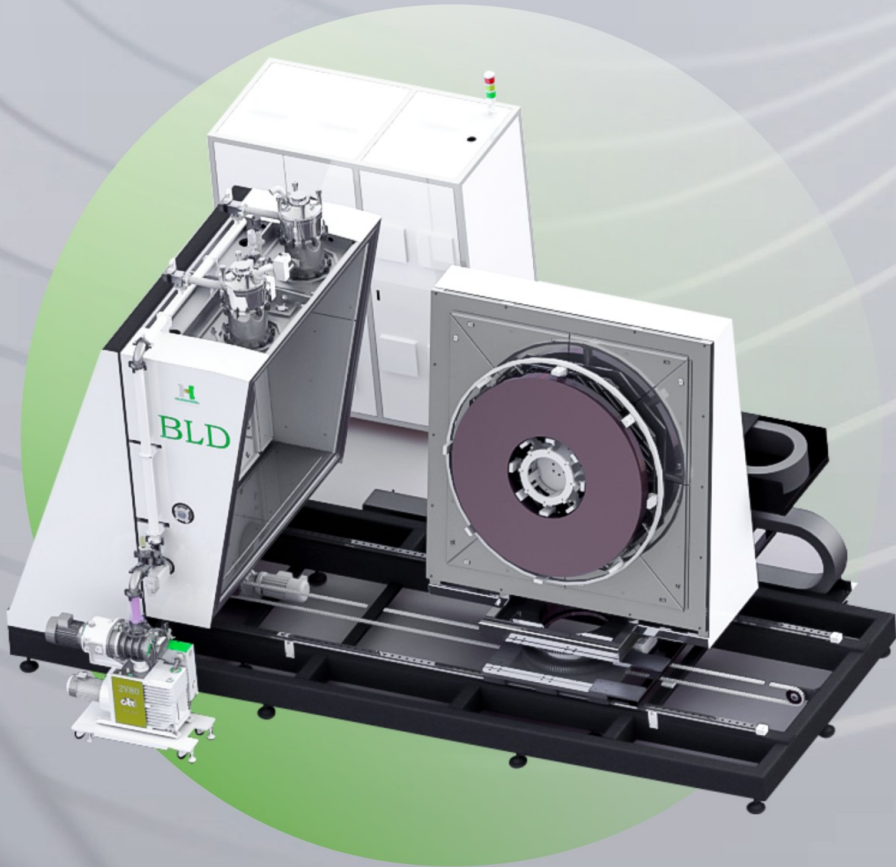
Equipment parameter



Allowed saw blade size
(internal diameter $\geq \Phi 560\text{mm}$, external diameter $\leq \Phi 1360\text{mm}$)



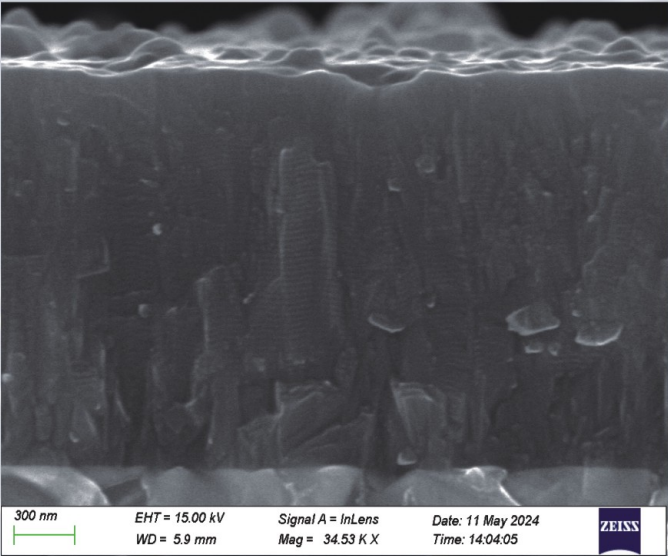
Properties	BLD
Coating Technology	Arc ion plating
Etching	The 2 nd generation lateral ion source (hot filament)
Arc Sources	4
Equipment size (mm)	Length 5400*Width 3200*Height 3200
Volume (m³)	1.8
Allowed saw blade size (mm)	Internal diameter ≥Φ560mm, external diameter ≤Φ1360mm
Max. allowed band saw height (mm)	100
Maximum working temperature (°C)	400
Maximum loading weight (kG)	600
Power (kW)	100
Rotation Speed (r/min)	1~15
Coating thickness (μm)	2~5
Process time (h)	AlTiN:8~10



HuaSheng® HBS110 COATING

HuaSheng® HBS110 Application

Milling: carbon steel, alloy steel,
stainless steel, cast iron



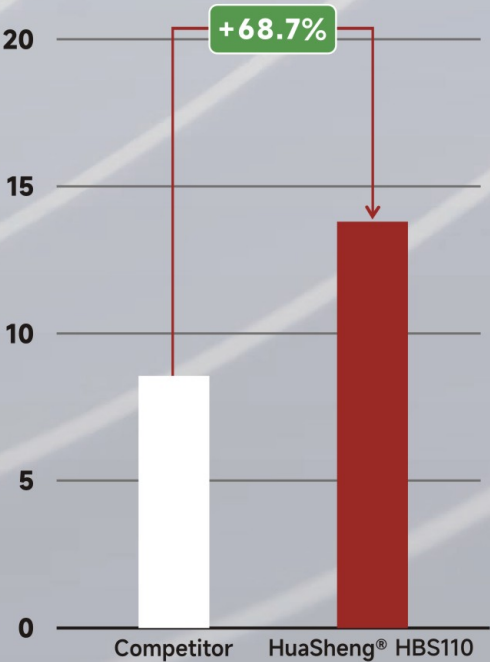
Coating material	AlTiXN
Coating color	grey black
Coating thickness (μm)	2.5±0.5
Vickers hardness (GPa)	34±2
Residual Stress (GPa)	-4.0±1
Coating temperature (°C)	< 500
Max. working temperature (°C)	1000

Coating structure	Coating performance
High aluminum content coating	Excellent oxidation resistance and wear resistance
Upgraded Nano-multilayers structure	Excellent thermal stability and oxidation resistance
Balance of coating hardness, toughness and residual stress	Comprehensive performance, wider processing applications

HuaSheng® HBS110 COATING

Case: Mold Steel 2738H

Tool Life/square



Tool data:
• 67-1/1.5-12980mm*1

Workpiece:
Mold Steel: 2738H

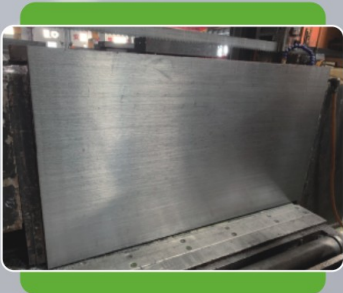
Cutting data: 45#steel

- Cutting speed: V= 22-30m/min
- Feed rate : 1.8-3mm/min
- Machine model : GD-4285/100
- Cooling : Cooling oil concentration 5%

Test results:

- Cutting area 13.5m2
- Manufacturer K cutting area of band saw 8m²

Data source: Filed customer



COATING PROCESS
RECOMMENDATION FORM

Coating Process Applications Recommendation

Cutting Material		Turning	Milling		Drilling	Threading	Gear Cutting
		Inserts	Inserts	End mills/PCB	Drills/Reamers	Taps	Hobs
P	Carbon steel	CT500 (Slotted Inserts) G4-F1 (percison parts) G4-U3 (Steel cutting)	HLM300 (General) HPM221 (Soft material) HE250 (Bronze) G4-U2	HLM300 (General) HPR125 (Soft material) G4-U1	HPD130 (General) HPD124 (High speed) G4-U1 G4-D1	AN510 (General) G4-T1 G4-T5 G4-R2	AP400 HPG220
	Alloy steel						
H	High hardness steel < 55HRC	SH363 (Chroma) G4-U2	SH363 (Chroma) HE250 (Bronze) G4-U2	HHR110 (Bronze) G4-S2	HPD124 G4-S3	AN510 (General) G4-S2	AP400 HPG220
	High hardness steel > 55HRC	HE250 (Bronze) G4-S3	HE250 (Bronze) G4-S3	HHR110 (Bronze) G4-S2	G4-S3	G4-S2	
M	201/316/304	HLM300 (General) SS330 (Purple) HMT130 (Rough finish) G4-S3 G4-U2	HLM300 (General) SS330 (Purple) HLT401 (Golden) G4-U2	HLM300 (General) G4-S2	HPD130 (General) HPD124 (High speed) G4-S3	AN510 (General) G4-S2	AP400 HPG220
K	Cast ion	HLM300 (General) G4-U2	HLM300 (General) G4-U2	HLM300 (General) G4-S2	HPD130 (General) HPD124 (High speed) G4-U1	AN510 (General) G4-R2 G4-T1 G4-T5	AP400 HPG220
S	Titanium alloy	HLM300 (General) G4-S3	HLM300 (General) HLT401 (Golden) G4-U2	HSR116 (Silver) HSR118 (Champagne gold) HHR110 (Bronze) G4-S2 (Bronze)	HPD130 (General) HPD124 (High speed) G4-S3	AN510 (General) G4-S2	
	Super alloy						
N	Cu/AlSi(Si<12%)			TC200/500		TC200/500	
	Cu/AlSi(Si > 12%)			HFR410		TC200/500	
	Regular PCB			AN400/TC200			
	PCB/CFRP			HFR410			
	Graphite			HGR410			

Coating Properites of HuaSheng at a Glance

Model	Grade	Compo-sition	Coulor		Thickness	Hardness	Residual stress	Coe. of friction	Anti-oxidation temp.	Recommended applications	Machining range
HA/MA	HPM221	AlCrTiXN		Golden yellow	2.7±1	35±3	-3.5±1	0.5	1100	Milling inserts	Steel general
	HE250	AlTiSiN		Bronze	2.5±1	37±3	-4.5±1	0.5	1100	Milling and turning inserts	Carbon steel, alloy steel
	SH363	AlTiN		Chroma	2.4±1	36±3	-4.0±1	0.5	1100	Milling and turning inserts	High hardness steel < 55 HRC
	HMT130	AlTiSiXN		Purple	2.7±1	35±3	-4.5±1	0.6	1100	Milling and turning inserts	Stainless steel general
	SS330	AlTiSiN		Red copper	2.1±1	37±3	-3.5±1	0.5	1200	Turning inserts	General turning
	HLT401	AlTiSiN		Golden yellow	2.8±1	37±3	-3.5±1	0.5	1000	Turning inserts	General turning
	HLM300	AlTiN		Black	2.5±1	35±3	-3.5±1	0.5	1000	Milling and turning, end mills inserts	General
	HPR125	AlCrN		Grayish black	2.5±1	34±3	-3.5±1	0.5	1100	End mills	Steel ≤48HRC
	HHR110	AlTiSiXN		Bronze	2.5±1	36±3	-5.5±1	0.6	1200	End mills	Steel ≥50HRC
	HSR116	TiB2-base		Silver	1.5±0.5	35±3	-4.0±1	0.4	1100	End mills	TC4 general
	HSR118	ZrN-base		Pale gold	2±1	30±3	-3.0±1	0.4	900	End mills	TC4 rough machining
	AN510	AlCrXN		Grayish black	2.0±0.5	37±3	-4.5±1	0.4	1100	End mills,taps	Carbon steel, alloy steel, cast ion
	AN400	AlCrXN		Grayish black	2.0±0.2	32±3	-4.5±1	0.4	1100	PCB, end mills, taps	PCB plate,mid~high TG plate, steel part
	HPD124	AlTiXN		Black	3.5±1	32±3	-3.5±1	0.4	1100	Drills	≤45HRC steel part, stainless steel
	HPD130	AlTiSiXN		Light bronze	3.5±1	35±3	-4.5±1	0.5	1100	Drills	General drilling
	AP400	AlCrN		Grayish black	3.0±1	34±3	-4.0±1	0.4	1100	Hobs	High hardness steel, steel part,cast(low cutting speed, low hardness)
	HPG220	AlCrXN		Grayish black	3.5±1	34±3	-4.0±1	0.4	1100	Hobs	High hardness steel, steel part,cast(high cutting speed, high hardness)
MC	CT500	AlTiSiN		Purple	3.9±1	34±3	-2.0±1	0.4	1100	Slotted blade	Carbon steel, alloy steel
TC	TC200/500	ta-C		Chroma	0.35±0.05	45±3	—	0.1	500	PCB, end mills, drills	PCB Al-substrate, Cu-AlSi (Si<12%), woodworking
DA	HGR410	C		Brilliant black	10.0±2	80-100	—	0.5	650	End mills	Graphite, ZrO, carbide, ceramic
	HFR410	C		Brilliant black	10.0±2	80-100	—	0.2	650	PCB, end mills, drills	AlSi(Si>12%), composition, CFRP
G4	F1	AlTiNHS		Grayish black	1±0.5	38±3	-3.0±1	0.3	1100	Highlighting mills	Carbon steel, alloy steel
	U1	AlTiNHS		Grayish black	3±1	38±3	-3.0±1	0.3	1100	General inserts,drills, taps	Carbon steel, alloy steel, cast ion
	U2	AlTiNHS		Grayish black	6±1.5	38±3	-3.0±1	0.3	1100	All inserts	Carbon steel, alloy steel, high hradness steel<55HRC,stainless steel,cast ion
	U3	AlTiNHS		Grayish black	9±2	38±3	-3.0±1	0.3	1100	Cast ion milling inserts, roughing inserts	Carbon steel, alloy steel, cast ion
	S1	AlTiSiNHS		Bronze	1±0.5	40±3	-4.0±1	0.3	1200	Highlighting mills	Carbon steel, alloy steel, high hardness steel<55HRC
	S2	AlTiSiNHS		Bronze	2±1	40±3	-4.0±1	0.3	1200	Stainless steel turning,drills end mills	Carbon steel, alloy steel, high hardness steel<55HRC
	S3	AlTiSiNHS		Bronze	3±1	40±3	-4.0±1	0.3	1200	Stainless steel turning,drills end mills	High hadrness steel, stainless steel,cast ion, super alloy
	R2	AlCrNHS		Gray	3±1	34±3	-4.0±1	0.4	1100	Taps, drills, round tools, end mills	Carbon steel, stainless steel, alloy steel ,cast ion
	T1	TiNHS		Golden yellow	4.5±1	32±3	-3.0±1	0.3	900	Taps	Carbon steel, alloy steel, cast ion
	T5	AlCrTiNHS		Golden yellow	4±1	34±3	-4.0±1	0.3	1100	Taps	Carbon steel, alloy steel, cast ion
	D1	AlCrSiNHS		Bronze	3.5±1	38±3	-4.0±1	0.3	1100	Drills	Carbon steel, alloy steel

Cutting Tools & Mold Coating Equipment

G4PRO



TC Series



MD Series



HA Series



DA600PRO



Specialized Machine Series



More specialized equipment will be launched , please stay tuned !