

2026

DA600PRO Diamond Coating Equipment

- To be the top surface solution supplier in the world.
- Make every effort to minimize industrial energy consumption.



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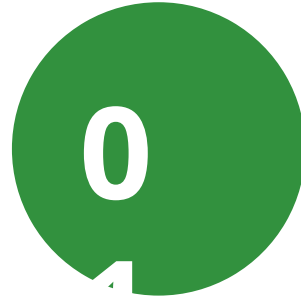
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DA600PRO INTRODUCTION

DA600PRO Introduction

DA600PRO diamond equipment innovatively developed by Huasheng features a parallel layout of hot wire arrays, ensuring a uniform temperature field. The equipment operates stably and reliably for long periods, with a fully automated process. It can store multiple process recipes to meet various application requirements.

01

Pre-treatment

Provide pre-treatment processes that match different materials to meet the requirements for diamond growth.

02

Multiple process formulas

Synthesize ultra-nanocrystalline, nanocrystalline, and micrometer crystalline diamonds of various thicknesses and large areas; the maximum effective deposition area can reach 0.09m².

03

High coating performance

Prepare diamond coatings with hardness higher than 85GPa, ultra-smooth, and high adhesion, including nanocrystalline, micrometer crystalline, or multi-layer coatings.

04

Multiple applications

Suitable for applications in composite materials, graphite, PCB ceramic substrates, AlSi alloys (Si>12%), CFRP, woodworking, and other working conditions.

02

DA600PRO CHARACTERISTICS

DA600PRO Characteristics



Basic hardware: DC power supply



Deposition method: Hot wire CVD



High deposition rate : Max 1.0 μ m/h



Wide range of film thickness : 4-30 μ m



DA600PRO Characteristics

Uniform temperature field

Double-layer water-cooling structure, which can ensure the synthesis of various thicknesses and large-area ultra-nanocrystalline, nanocrystalline and micrometer crystalline diamond.

Low-failure-rate heating filament with stabilized operation

The reasonable filament structure design combined with cavity pressure control reduces the filament breakage failure rate.

High loading capacity

Use of high-power power supply increases the coating loading capacity without compromising coating performance (800 pcs/batch; D3.175)

Multi-field applications

Suitable for complex working conditions such as composite materials, graphite, PCB ceramic substrates, AlSi alloys (Si > 12%), CFRP, woodworking, etc.

Good uniformity of film thickness

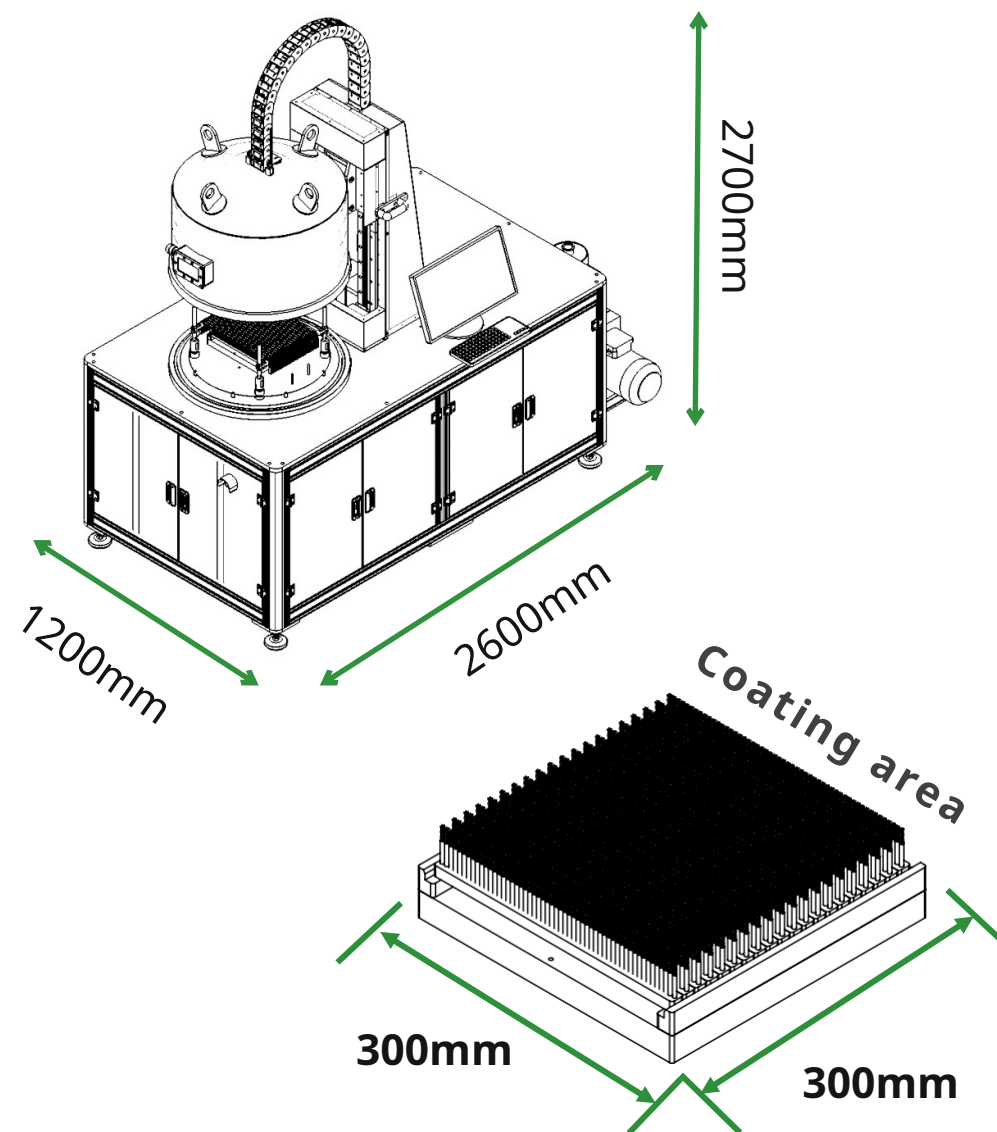
Uniformity of film thickness for coated cutting tools is less than 15%; a wider range of cutting tools can be coated, with higher compatibility.

03

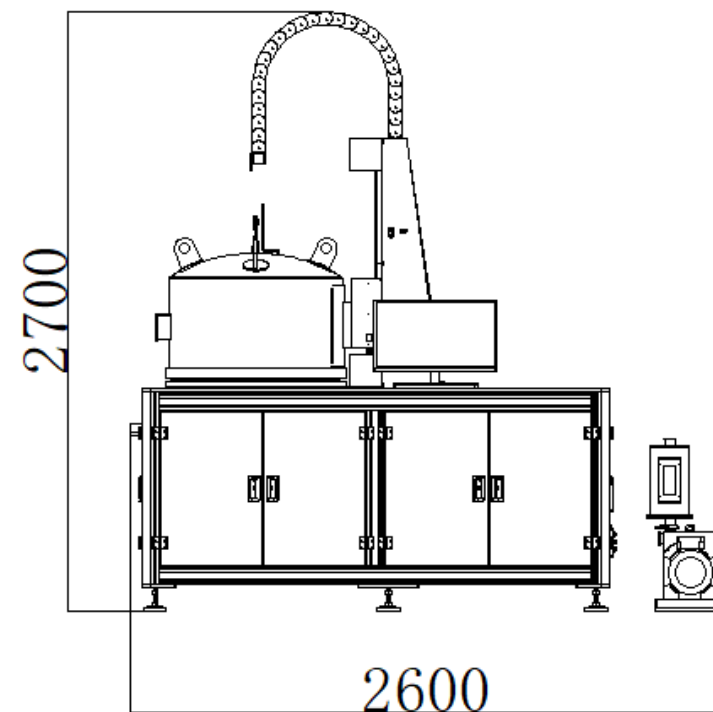
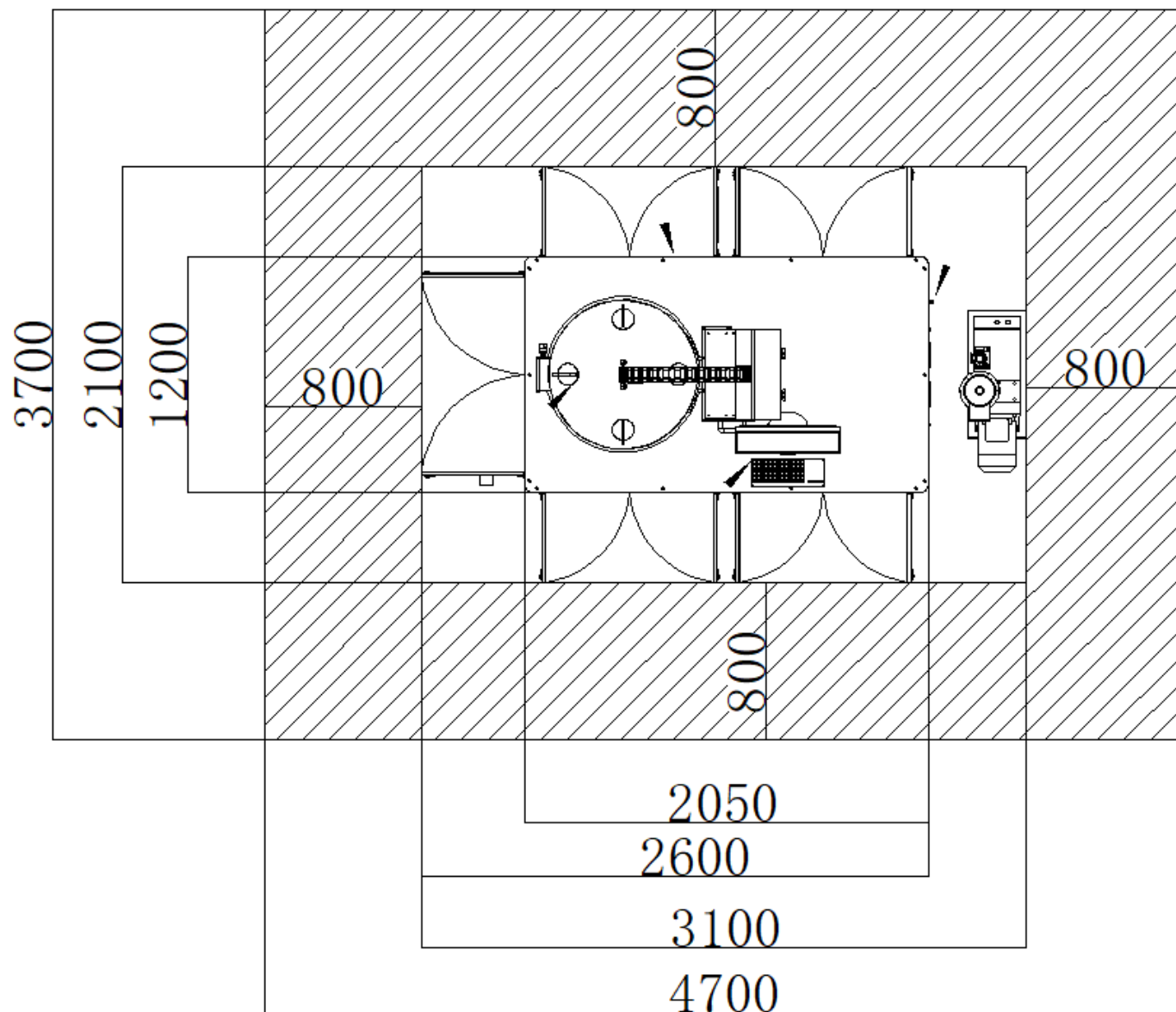
DA600PRO PARAMETERS

DA600PRO Parameters

Model	DA600PRO
Coating technology	Hot filament CVD
Equipment size (mm)	length2600*width1200* height2700
Volume (m ³)	0.16
Coating area (mm)	300*300
Maximum of paintable end mills (mm)	D16*150
Capacity (D3)	500pcs
Process time (h)	16~33



DA600PRO Layout Size



DA600PRO Electrical Parameters

Model	DA600PRO
Voltage	3*380/220V (3L+N+PE)
Current	75A
Power	50kW
Frequency	50/60Hz
Water Cold 22~26°C	5-5.5bar
Compressed air	5-6.5bar
Process gas : H ₂ /Ar/CH ₄	1.0-1.2bar

DA600PRO Consumption Volume



Model	DA600PRO
Minimum Purity	H ₂ 99.995%
	Ar 99.995%
	CH ₄ 99.6%
Consumption per batch	H ₂ 2.5L
	Ar 12L
	CH ₄ 0.5L
Cooling water	Max heat emission ≈20kW Flow rate 35L/min
Electric power supply	Avg power ≈18kW/h Batch duration ≈2.5h (subject to process)

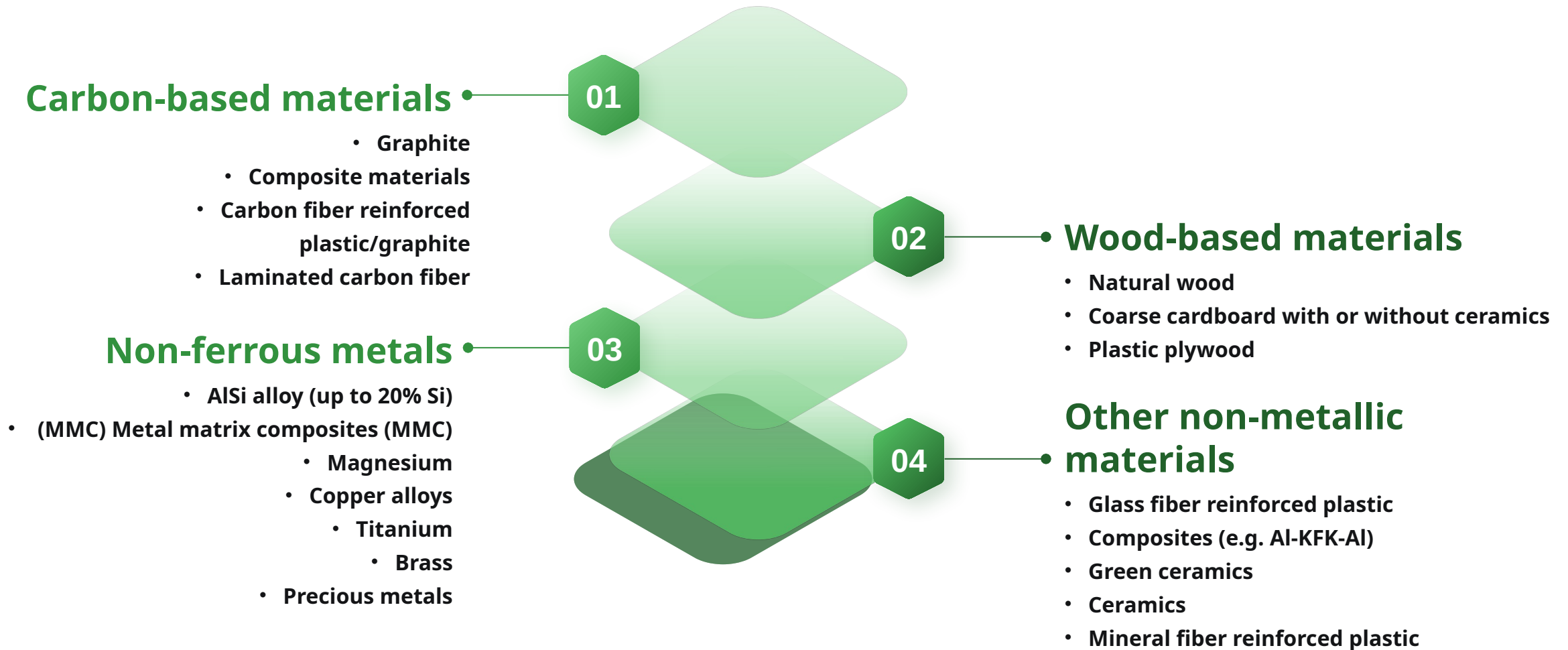
List of Core Components

Item	Name	Quantity	Brand	Parameter description
1	Backing pump	1	Leybold	D63L pumping speed 60m ³ /h
2	power supply	1	Inpower/other	40kW/125VDC/320A
3	flow meter	3	Sevenstar	H ₂ 、Ar、CH ₄
4	Automation control system	1	Huasheng	IPC based distributed control system
5	Chamber	1	Huasheng	Stainless steel, jacket water cooling
6	Workpiece transmission system	1	Huasheng	Servo-driven tool positioning accuracy
7	Vacuum measurement	2	Inficon	Baratron-CDG025Dx3, Pirani-PSG500
8	Pneumatic control system	1	Airtac	Solenoid valve, sensor
9	Cooling control system	1	NNT/other	Water temperature and flow sensor, pressure sensor

04

DA600PRO TECHNOLOGY

Application Scope of CVD Diamond Coating



HuaSheng® Diamond Grades Application

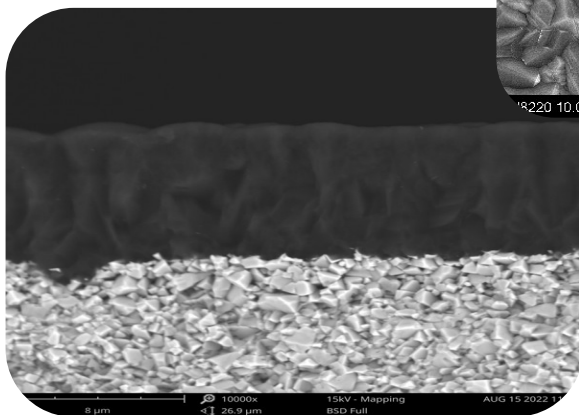
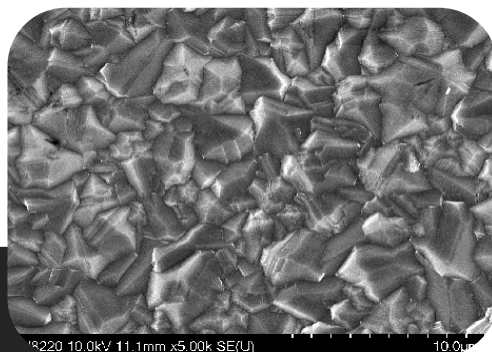


No.	HGR410	HFR410
Coating Material	C	C
Microhardness(GPa)	80-100	80-100
Coating Thickness (μm)	9±1	10±2
Dry Friction Coefficient	0.2	0.2
Coating Temperature(°C)	>500	>500
Oxidation Temperature(°C)	650	650
Application Range	Graphite, zirconia, ceramics, metal carbides	PCB boards, high-silicon aluminum, CFRP and other composite materials

HuaSheng® HGR410

App licat ion

- ◆ Graphite processing
- ◆ Dental prosthesis processing
- ◆ Ceramic processing

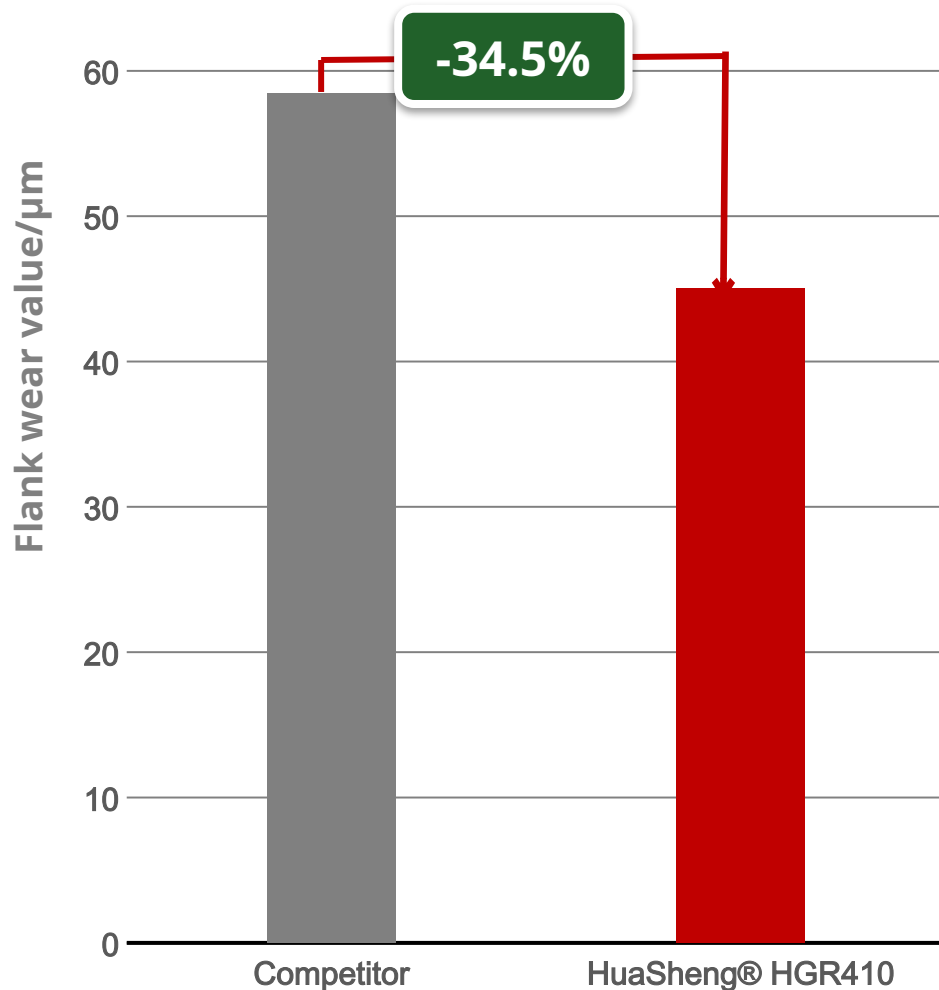


Coating Materials	C
Coating colour	Bright black
Coating thicknes (μm)	9 $\pm$ 1
Coating hardness HIT(GPa)	80-100
COF	0.2
Coating temperature($^{\circ}\text{C}$)	>500
Oxidation resistance temperature ($^{\circ}\text{C}$)	650

Coating Structure	Coating Performance
Adjust gas composition and cavity pressure	Diamond with high crystalline quality, achieving higher wear resistance and better bonding performance
Optimize fine-grained crystal grains	Reduce the surface roughness of the cutting tool, with better application on products with high roughness requirements

HuaSheng® HGR410 Case Introduction

- Donghai graphite HK-75



Tool Specification :

- Ball end mill D1.5R0.75*8*D4*50L*2F

Workpiece:

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

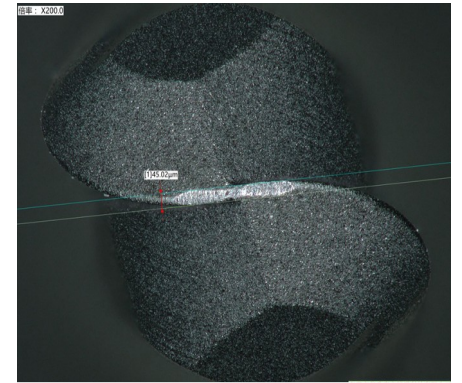
Test Conditions: Side milling rough machining

- Cutting Speed $V_c = 105\text{m/min}$
- Feed Speed $F_z = 0.068\text{mm}$
- Cutting Depth $a_p = 0.03\text{mm}$
- Cutting Width $a_e = 0.035\text{mm}$
- Cooling Method : Cold air cooling
- Test Equipment: Weifeng Precision Machinery

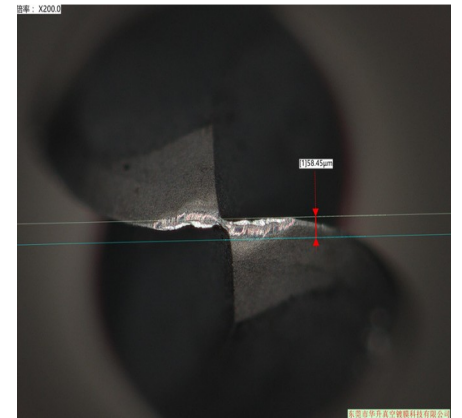
Test Results:

1. HGR410 tool edge wear: $45.02\text{ }\mu\text{m}$
2. Tool from competitor: Edge wear of $58.45\text{ }\mu\text{m}$, with edge chipping observed.

Data Source: External suppliers



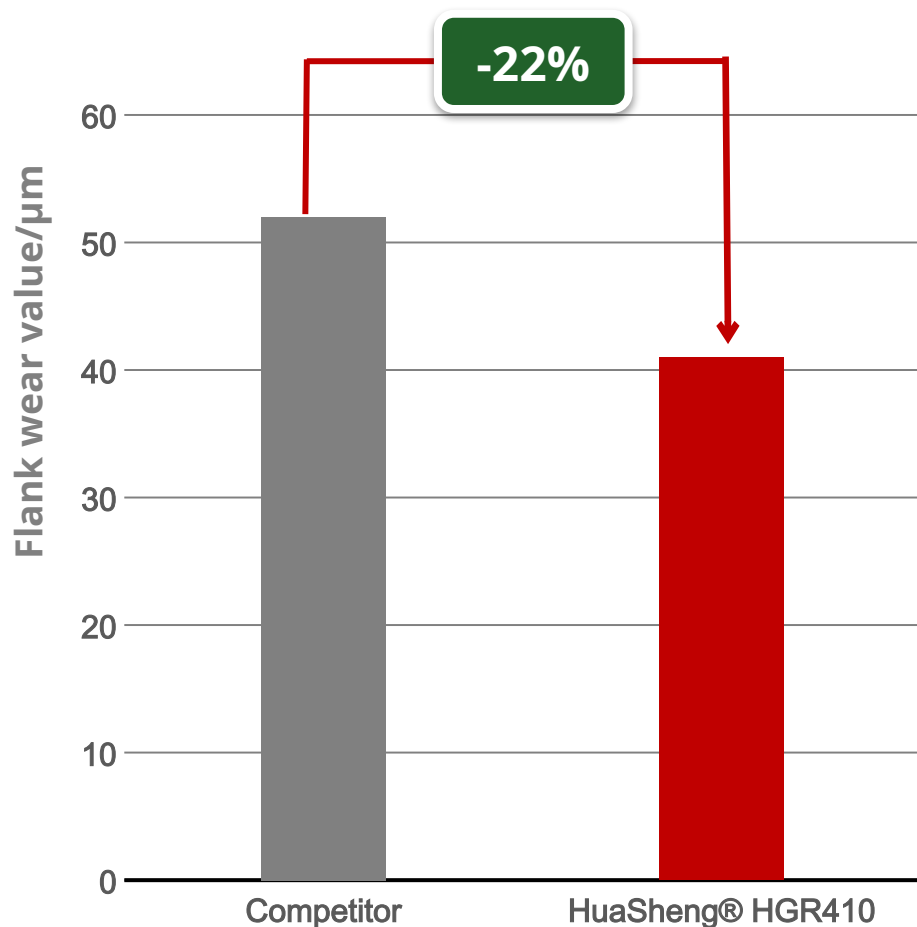
**45.02µm Wear-
HGR410**



**58.45µm Wear-
Competitor**

HuaSheng® HGR410 Case Introduction

- **HPG-50**



Tool Specification :

- Ball end mill D1.5R0.75*8*D4*50L*2F

Workpiece:

- HPG-50

Test Conditions: Side milling rough machining

Cutting Speed: $V_c = 94.2$ m/min

Cutting Width: $a_e = 0.037$ mm

Feed per Tooth: $F_z = 0.075$ mm

Cooling Method: Air cooling

Cutting Depth: $a_p = 0.03$ mm

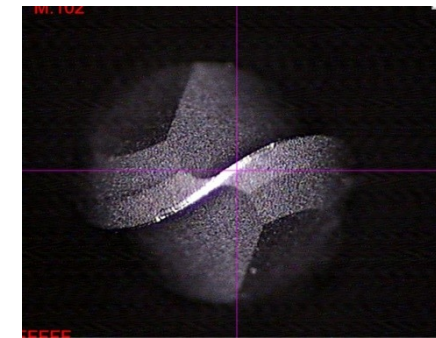
Testing Equipment: Makino



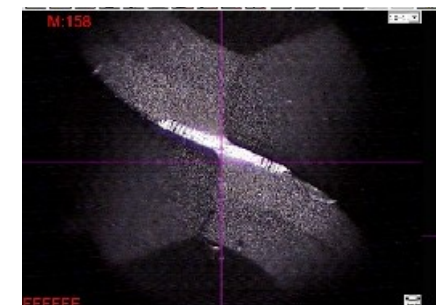
Test Results (after 120 minutes of machining):

1. HGR410 tool: Minor edge wear observed.
2. Tool from competitor: Significant edge wear width detected.

Data Source: Client terminal



Wear-HGR410

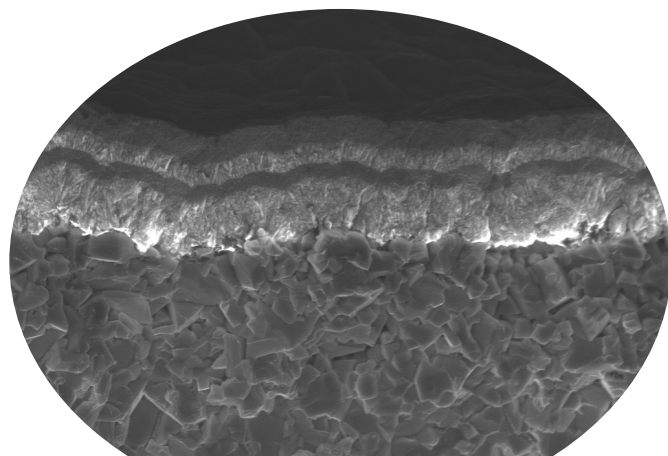


Wear-Competitor

HuaSheng® HFR410

Appl icati on

- ◆ High-conductivity plate processing
- ◆ Composite material processing
- ◆ Carbon fiber processing



~4T= 10.00 kV
~5 mm
Signal A = InLens
Mag = 8.74 KX
Date: 10 Dec 20
Time: 14



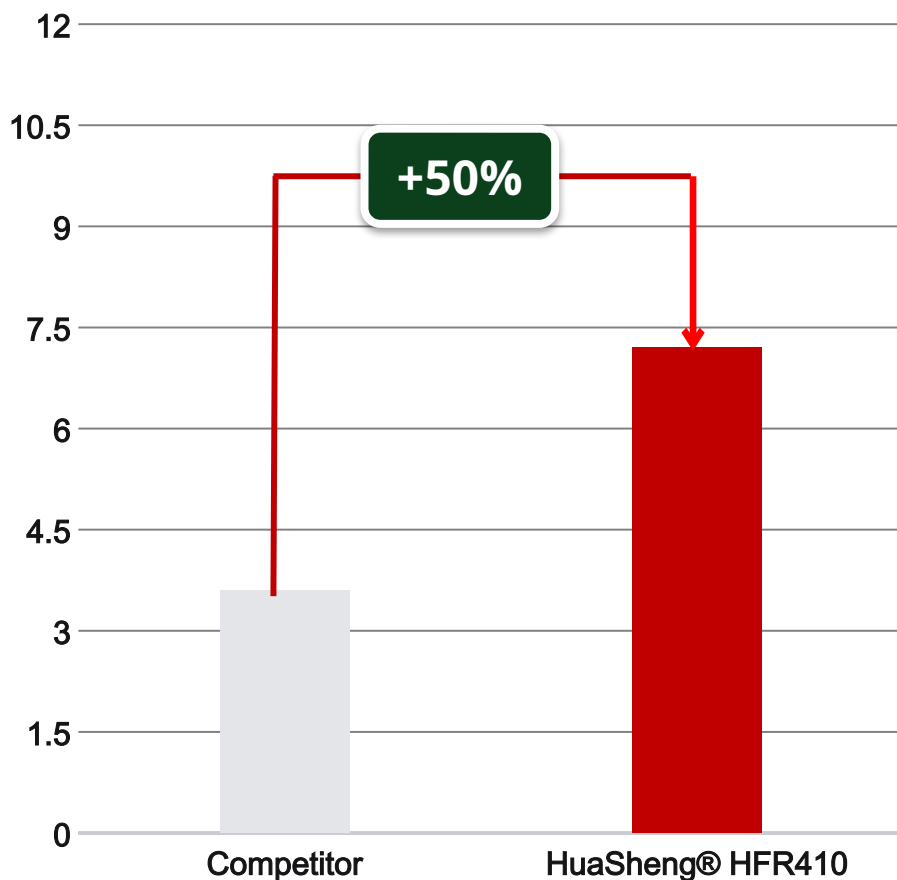
Coating Materials	C
Coating colour	Bright black
Coating thicknes (μm)	10±2
Coating hardness HIT(GPa)	80-100
COF	0.2
Coating temperature(°C)	>500
Oxidation resistance temperature (°C)	650

Coating Structure	Coating Performance
Adjust the gas composition and optimize the coarse crystal orientation	Achieve high-quality crystalline diamond with superior wear resistance and better bonding performance
Optimize the thickness ratio of multi-layer coarse and fine grain films	Enhance impact resistance and extend service life in composite material processing

HuaSheng® HFR410 Case Introduction

- Case : 4mm T800 carbon fiber board

Tool life/m



Tool Specification :

- D6*20*100*D6

Workpiece:

- 4mm T800 carbon fiber board

Test Condition: Climb milling

Cutting Speed $V_c = 150$ m/min

Cutting Depth $a_e = 3$ mm

Feed Rate $F = 0.6$ m/min

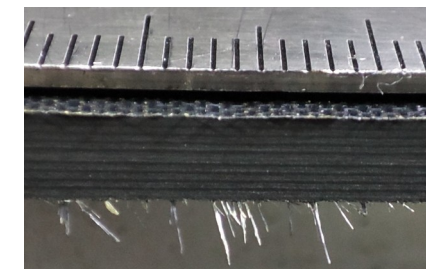
Cooling Method: Dry milling + dust collection



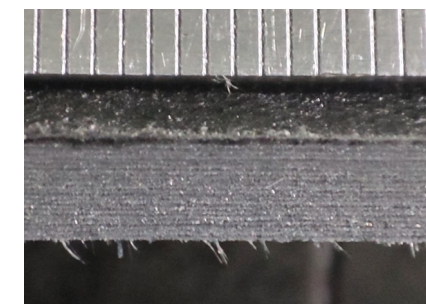
Test Results:

- Huasheng HFR410 coated tool can machine 7.2m ;
- Comprtitor X coated tool life of 3.6m ;
- 50% increase in cutting life

Data Source: Terminal tool testing center



**7.2m Wear-
HFR410**



**3.6m Wear-
Competitor**

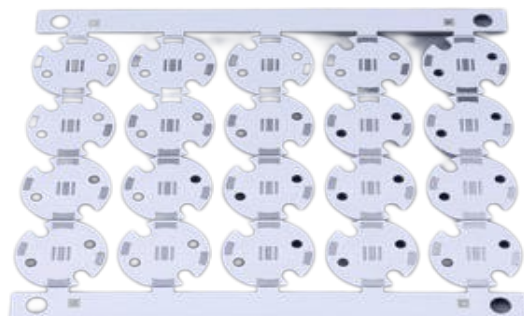
HuaSheng® HFR410 Precision Finishing Coating



HuaSheng® HFR410

Appl icati on

- ◆ High-conductivity plate processing
- ◆ Composite material processing
- ◆ Carbon fiber processing

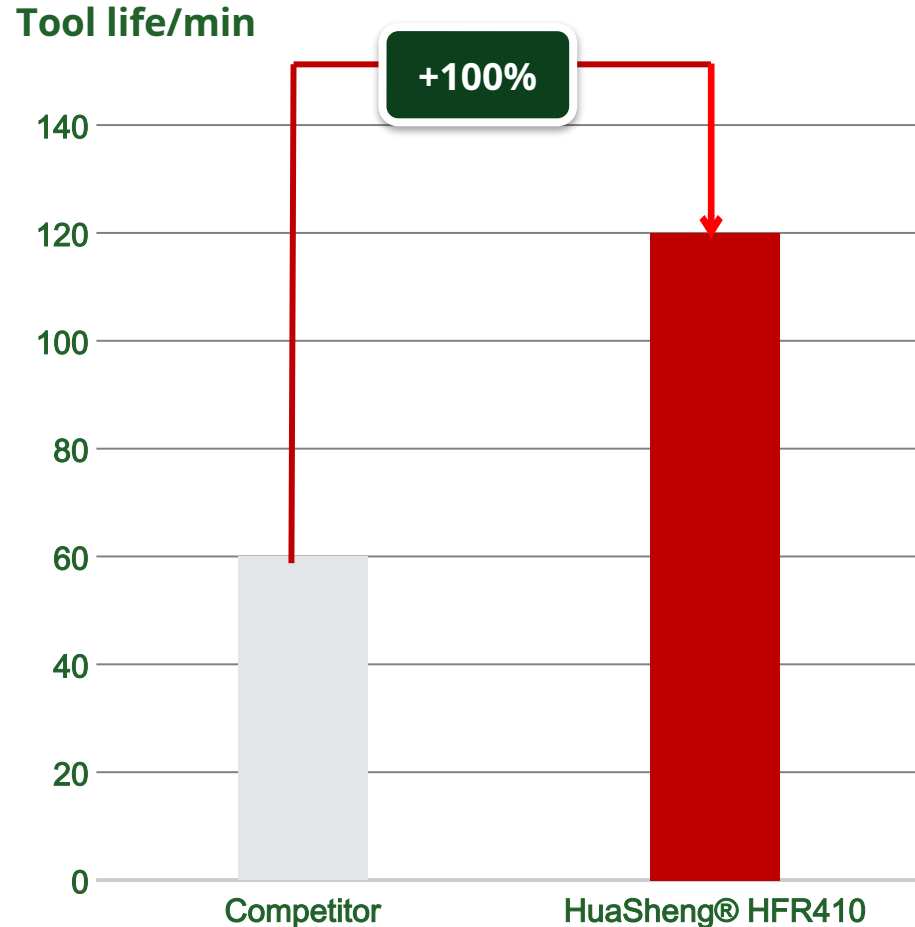


Coating Materials	C
Coating colour	Bright black
Coating thicknes (μm)	10 $\pm$ 2
Coating hardness HV(GPa)	80-100
COF	0.2
Coating temperature($^{\circ}\text{C}$)	>500
Oxidation resistance temperature ($^{\circ}\text{C}$)	650

Coating Structure	Coating Performance
Adjust the gas composition and optimize the coarse crystal orientation	Achieve high-quality crystalline diamond with superior wear resistance and better bonding performance
Optimize the thickness ratio of multi-layer coarse and fine grain films	Enhance impact resistance and extend service life in composite material processing

HuaSheng® HFR410 Case Introduction

- Case: Aluminum-based board (3W; 70 microns copper thickness)



Tool Specification :

- 1.8*9

Workpiece:

- Aluminum-based board (3W; 70 microns copper thickness)

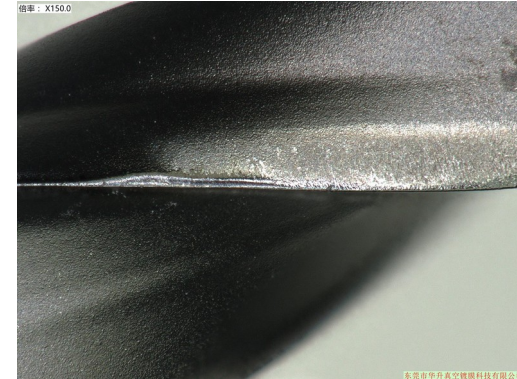
Test Condition: Blind hole drilling

- Cutting Speed $V_c = 264\text{m/min}$
- Feed Rate $F = 0.96\text{m/min}$
- Cutting Depth $a_p = 4.8\text{mm}$
- Cooling Method : Cold air cooling

Test Results:

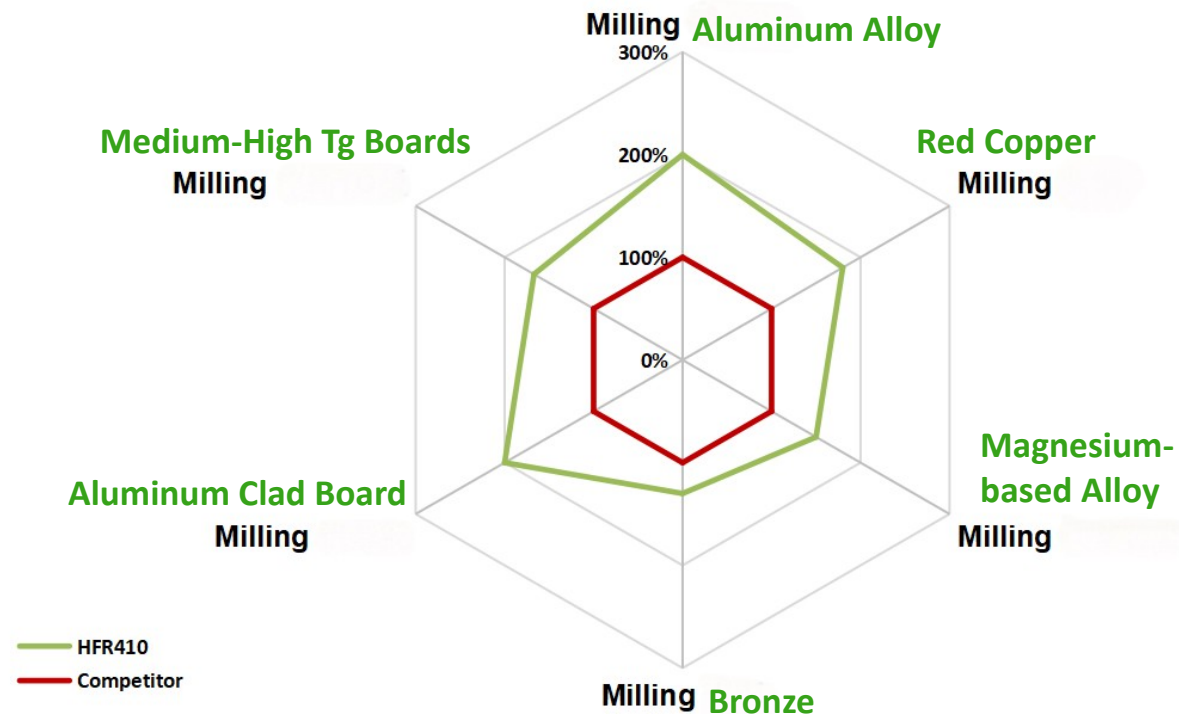
- HFR410 coated tool from Huasheng can be used for 120 meters of cutting
- Coated tool from other manufacturer has a service life of 60 meters;
- Cutting life is increased by 100%.

Data Source: Huasheng Machining Laboratory



HuaSheng® HFR410 Cutting Performance

HFR410 Comprehensive Application Profile



Cutting Performance

	HFR410	Competitor
- Aluminum Clad Board - Drilling and milling	200% (120 m)	100% (60 m)
- Medium-High Tg Boards - Drilling and milling	167% (>300 m)	100% (180 m)



Your Ideas, Our Solution

THANKS