

Henan Huanghe Whirlwind Co.,Ltd



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Catalogue

I. Company Profile

II. Products Introduction

III. Products Application

IV. Products Advantage

V. After-sales Service &Tech Support

I. Company Profile



Key Support

From Henan
Province

Top500

National
Private
Enterprise

Top 10

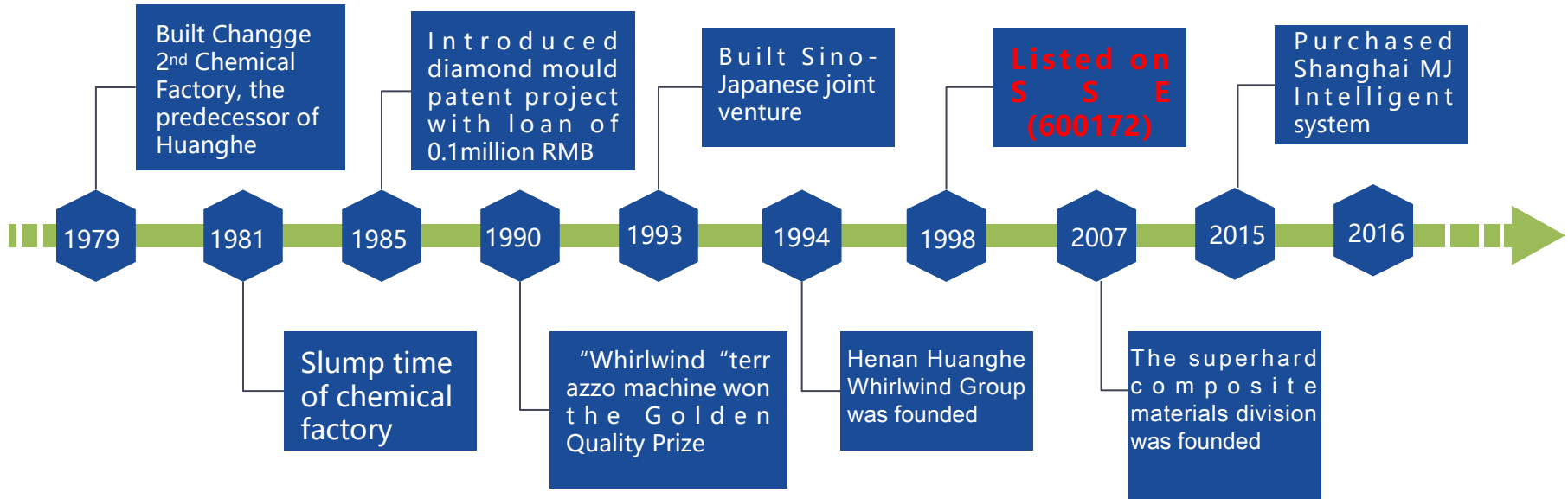
Provincial
Private
Enterprise

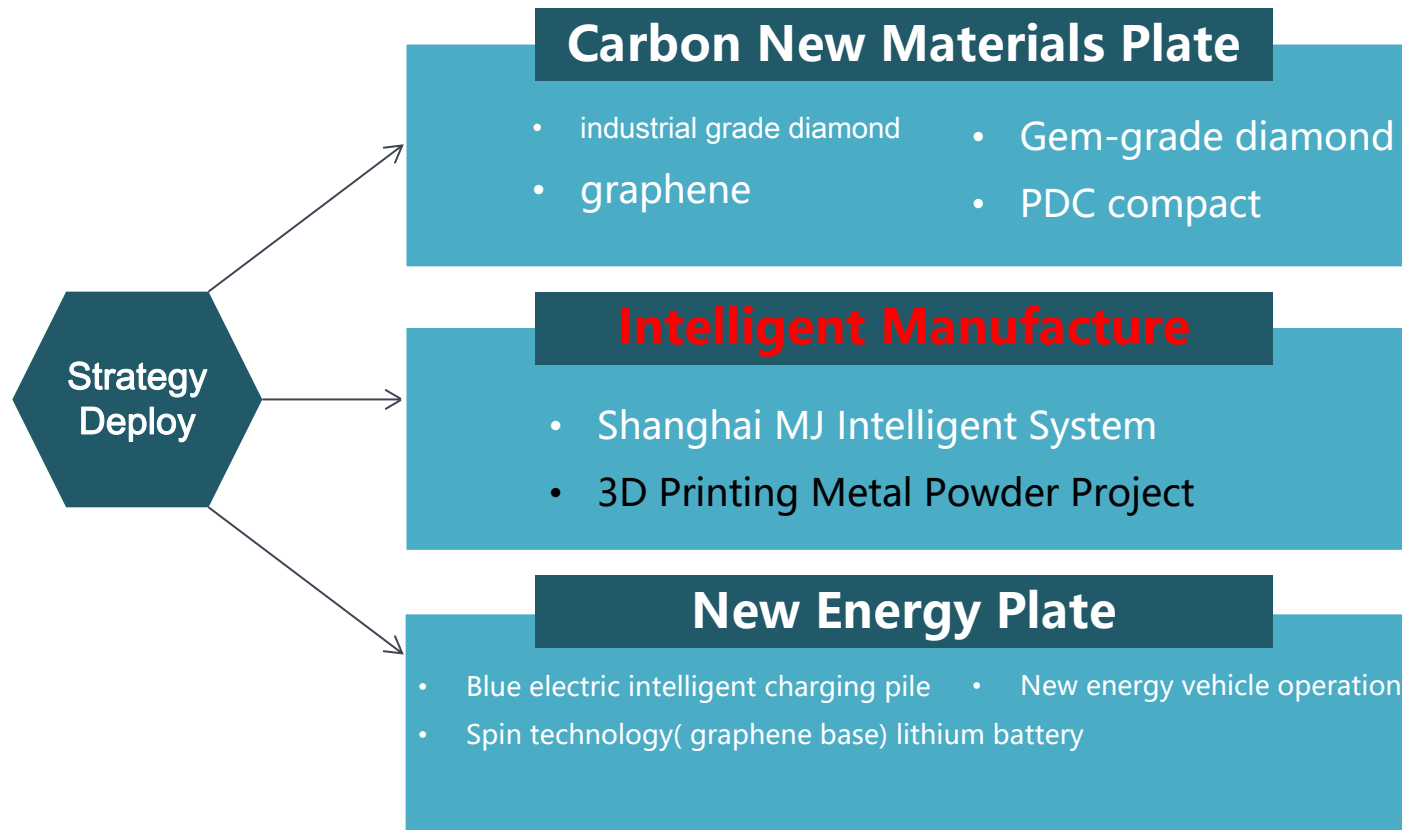
Henan Huanghe Whirlwind Co.,Ltd Co.,Ltd listed in 1998,is the first listed private enterprise of superhard materials industry of China. The main products cover six series-products, superhard materials&products, superhard composite materials&products, metal powder, and so on. The company has stuck to the development strategies of diversification, internationalization and intellectualization. The main product “Whirlwind” synthetic diamond has been praised as “China top brand” by National Bureau of Quality Inspection with annual amount of 3.5 billion Karats and large-scale superhard material production base. Meanwhile, we devote to the development of industry 4.0 and intelligent manufacturing and concentrate on the application and industrialization of 3D printing technology.

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Development History







I. Company Profile



- | | |
|--|--|
| 1 National enterprise technology center | 1 National intellectual property rights bureau patents test enterprise |
| 2 National high-tech enterprise | 2 China top brand |
| 3 National innovation enterprise | 3 Henan province top hundred enterprises |
| 4 Enterprise postdoctoral research station | 4 Henan province technology innovation model enterprise |
| 5 Diamond standardizaion work group supporting unit | 5 Physical and chemical analysis center for superhard materials |
| 6 Henan province superhard composite materials& products t research center | 6 Changge diamond city of superhard materials industrial production base |



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II. Products Introduction

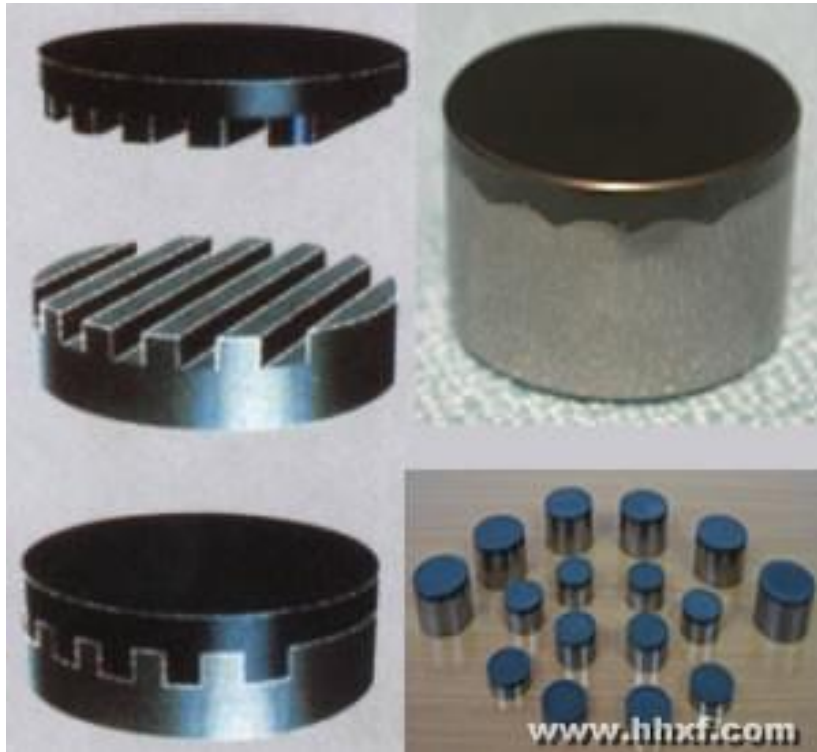
III. Products Application

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II. Products Introduction

□ High impact& wear resistance



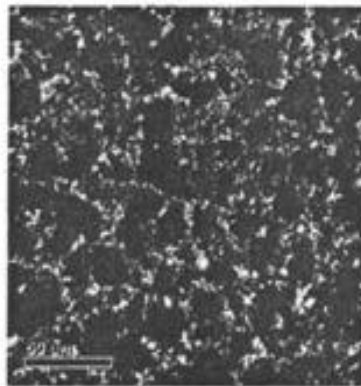
Polycrystalline Diamond Composite, short for PDC, a new superhard composite, which is made from a carbide substrate and diamond grit synthesizing at one-time under high temperature and high pressure conditions. It develops base on the development of polycrystalline diamond and has the high impact and wear resistance characters of diamonds.

II. Products Introduction

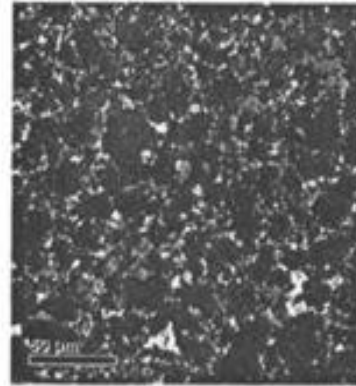


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□ With isotropy

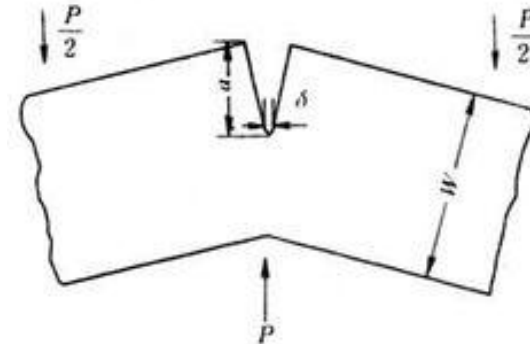


(a)



(b)

□ with certain impact toughness

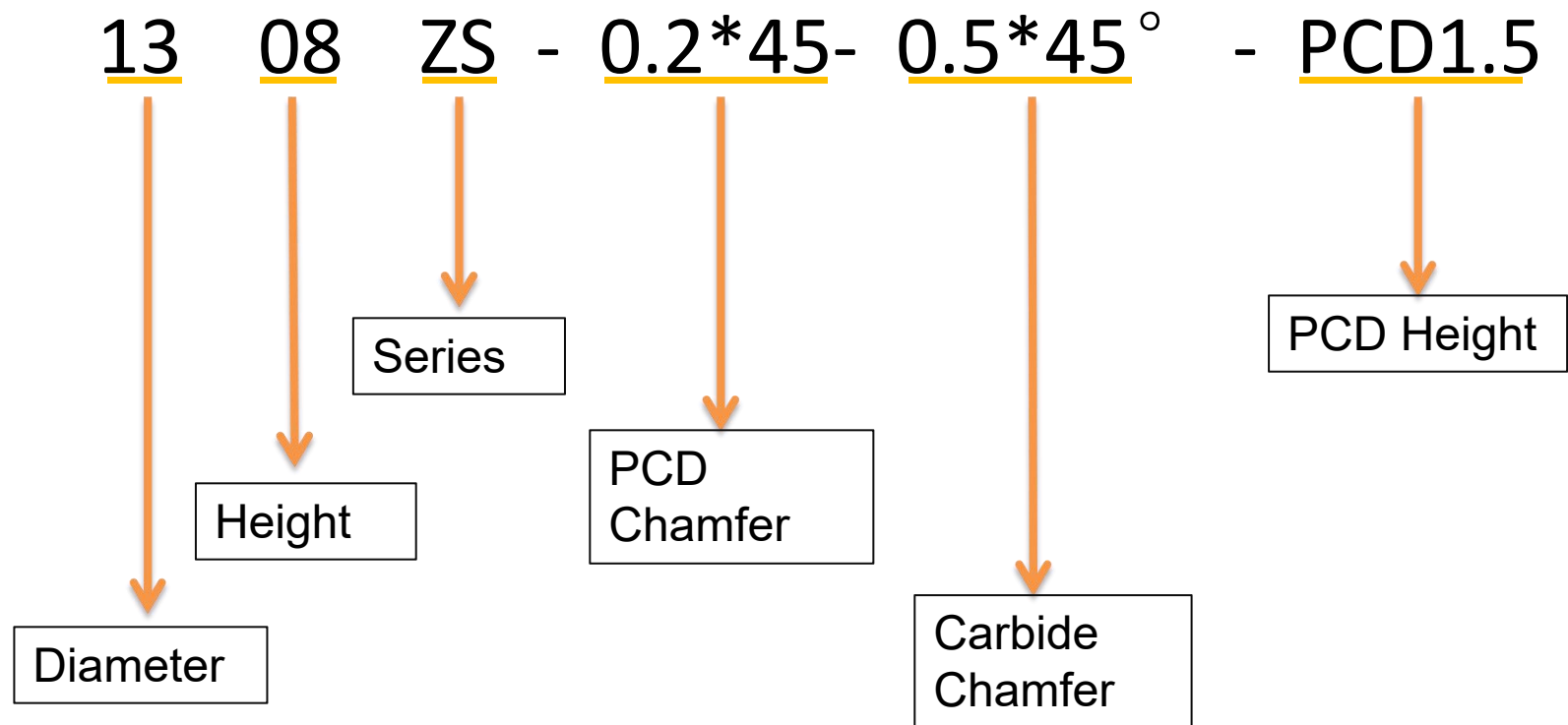


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Nomination samples:

1308ZS-0.2*45° -0.5*45° -PCD1.5



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II. Products Introduction-nomination rules

- Notes:
- 1、Diameter, height: 10mm below, take an integer, Add zero to an integer; 10mm above integers; diameter is 15.88mm, take 16;
- 2、Among all the types, use Arabic numbers if new types come out;
- 3、PCD chamfer、carbide chamfer, zero stands for no chamfer;
- 4、PCD chamfer 、 carbide chamfer 、 PCD height : all use metric sizes (mm) , PCD height take one digit; PCD chamfer and carbide chamfer take two digits ;



II. Products introduction – specification(diameter/height)



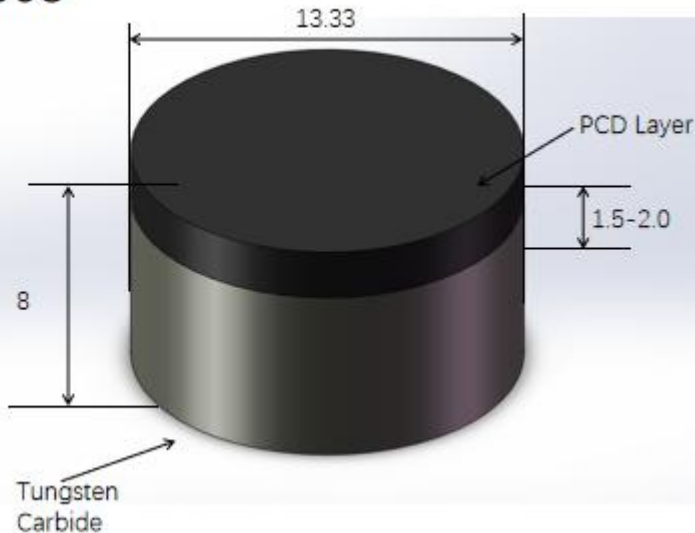
Size	diameter (mm)	Diamond layer (mm)	Height (mm)	Wear resistance ($\times 10^4$)	Impact toughness (J)
1004F	10.00	1.3-1.5	4.5	≥ 20	≥ 300
1304K	13.44	1.3-1.5	4.5	≥ 20	≥ 300
1204Y	12.50	1.4-1.6	4.5	≥ 28	≥ 400
1304Y	13.44	1.4-1.6	4.7	≥ 28	≥ 400

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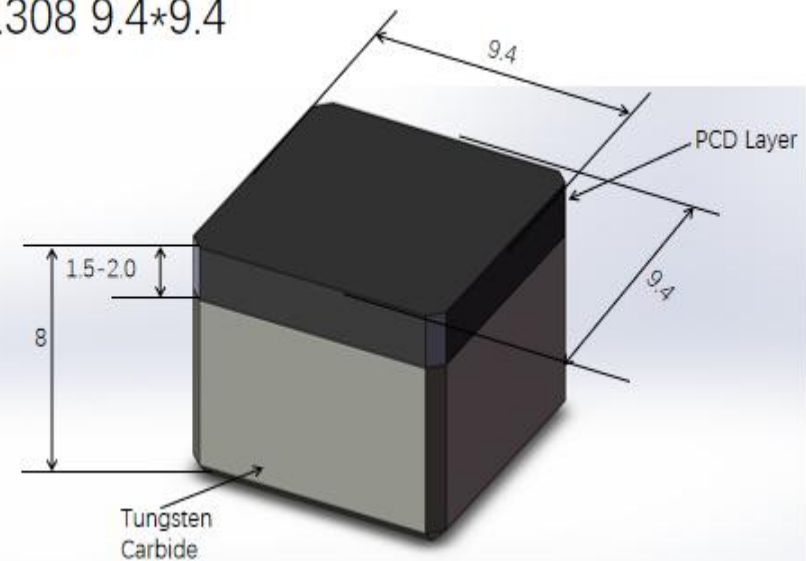


II. Products introduction – specification(diameter/height)

1308



1308 9.4*9.4



- Diameter standard: 8.0/10.0/13.4 \pm 0.05mm, height : 4.5/5.0/8.0 \pm 0.1mm
- Diamond layer height 1304: 1.0/1.2/1.4 \pm 0.1; 1308: 1.7/2.0/2.5 \pm 0.1mm, the binding surface shapes between diamond and carbide are straight line and wave-like line; diamond layer chamfer with national common standard 0.4-0.5*45°, abroad standard is 0.2-0.3*45°, the carbide chamfer national standard is 0.4-0.5*45°, abroad standard is 0.6-0.7*45°.

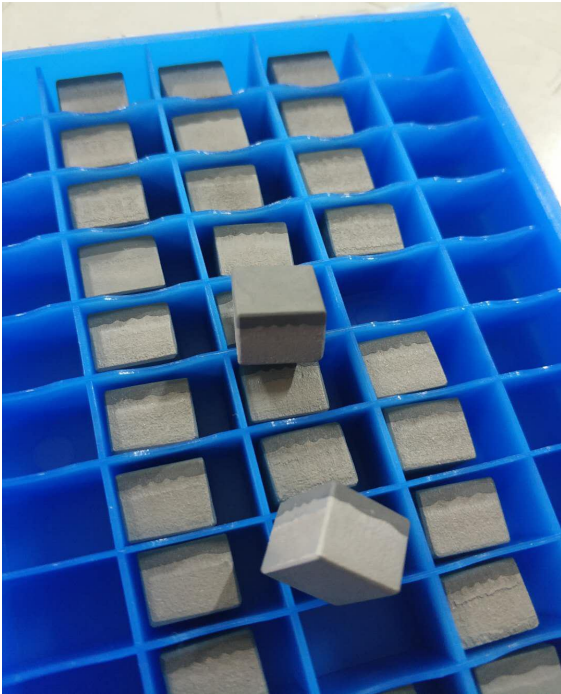
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II. Products introduction – specification(diameter/height)

Laser cutting machining precision: $\pm 0.05\text{mm}$

Wire cutting machining precision: $\pm 0.01\text{mm}$



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II. Products introduction – specification(diameter/height)

产品型号	直径 (mm)	复合层厚度 (mm)	高度(mm)	磨耗比 (×10 ⁴)	抗冲击韧性 (J)
1304HY	13.44	1.0-1.2	4.5	≥35	≥600
1308HY	13.44	1.3-1.5	8.0	≥35	≥800
1308ZH	13.44	1.4-1.6	8.0	≥35	≥800

注：可按客户要求尺寸生产。

产品型号	直径 (mm)	复合层厚度 (mm)	高度(mm)	磨耗比 (×10 ⁴)	抗冲击韧性 (J)
1604	16.00	1.4-1.6	4.5	≥25	≥400
1608	16.00	1.6-2.0	8.0	≥25	≥400
1613	16.00	1.8-2.2	13.2	≥30	≥600
1904	19.05	1.4-1.6	4.5	≥25	≥400
1908	19.05	1.6-2.0	8.0	≥30	≥600
1913	19.05	1.8-2.2	13.2	≥30	≥600
2108	21.5	1.6-2.0	8.0	≥30	≥600
2508	25.00	1.6-2.0	8.0	≥30	≥600
3404	34.00	1.4-1.6	5.0	≥30	≥600
3406	34.00	1.4-1.6	6.0	≥30	≥600

注：可按客户要求尺寸生产。

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II. Products introduction – flat layer



PDC for geological drilling combines closely and has little binding agent. It is suitable for soft and medium rock formations with higher heat stability, wearresistance and impact toughness, which can be used in the field of mine supporting ad geological exploration.

Size	diameter (mm)	Diamond layer (mm)	Height (mm)	Wear resistance ($\times 10^4$)	Impact toughness (J)
1304Y	13.44	1.0-1.2	4.5	≥ 35	≥ 600
1308ZS	13.44	1.7-1.8	8.0	≥ 35	≥ 800
1308ZH	13.44	1.4-1.6	8.0	≥ 35	≥ 800

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II. Products introduction –curved layer



Curved PDC adopts non-planar exterior structure, which can ease the impact toughness suffered by the PDC cutters during the drilling process, reduce the wearout and increase bits' service life. Application: complex and changeable strata.

Size	Diameter (mm)	Diamond layer (mm)	Height (mm)	Wear resistance ($\times 10^4$)	Impact toughness (J)
1304Q	13.44	1.3-1.5	4.5-4.8	≥ 20	≥ 800
1308QS	13.44	1.4-1.7	8.2-8.5	≥ 25	≥ 800
1304V	13.44	1.2-1.5	5.2-5.6	≥ 20	≥ 600
1308V	13.44	1.2-1.5	8.2-8.6	≥ 25	≥ 600
1306GK	13.44	1.2-1.5	6.2-6.6	≥ 25	≥ 600
1308GK	13.44	1.3-1.6	8.2-8.6	≥ 25	≥ 600

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II. Products Introduction-PDC bits

Products advantages

PDC is a new superhard material, which is synthesized with medium-high cobalt carbide and synthetic diamond polycrystalline under high temperature and high pressure. The bits made with PDC have superior characters compared with traditional carbide bits, whose service life is 10 to 30 times than the later, and the time-saving performance is 50% higher.

Products size

- 1.Regular size: $\Phi 65$ 、 $\Phi 75$ 、 $\Phi 84$ 、 $\Phi 89$ 、 $\Phi 94$ 、 $\Phi 113$ 、 $\Phi 133$ 、 $\Phi 147$ 、 $\Phi 153$
- 2.According to customers' requirements

Products characters

1. High wear resistance and high impact toughness;
2. Without special requirements for instruments;
3. Multiple free cutting surfaces, high drilling efficiency, long service life, strong bits diameter protection capability.
4. Short drill time, low worker labor strength and high comprehensive performance.

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II. Products Introduction- Anchor bits



Advantages:

- Use new materials
- Good stability & strong impact toughness
- High drilling efficiency for soft and medium rock formations

Types: half、whole、double-wings, triple-wings

Size: Ø27, Ø28, Ø30, Ø32, Ø44

Application: underground coal mine , transportation, drilling for anchor net holes in water and electricity fields.

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II. Products Introduction- Anchor bits



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II. Products introduction-PDC bits (steel body)



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II. Products introduction-PDC bits (steel body)



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Site core samples

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II. Products Introduction-PDC matrix bits



Characters

PDC matrix bits designed for hard rock stratum, with high wear resistance and impact toughness. It can be designed with different cutting surfaces according to different rock strata, the bits will keep good diameter-protecting and high drilling performance.

Usage

Applied for drilling above medium-hard rock strata.

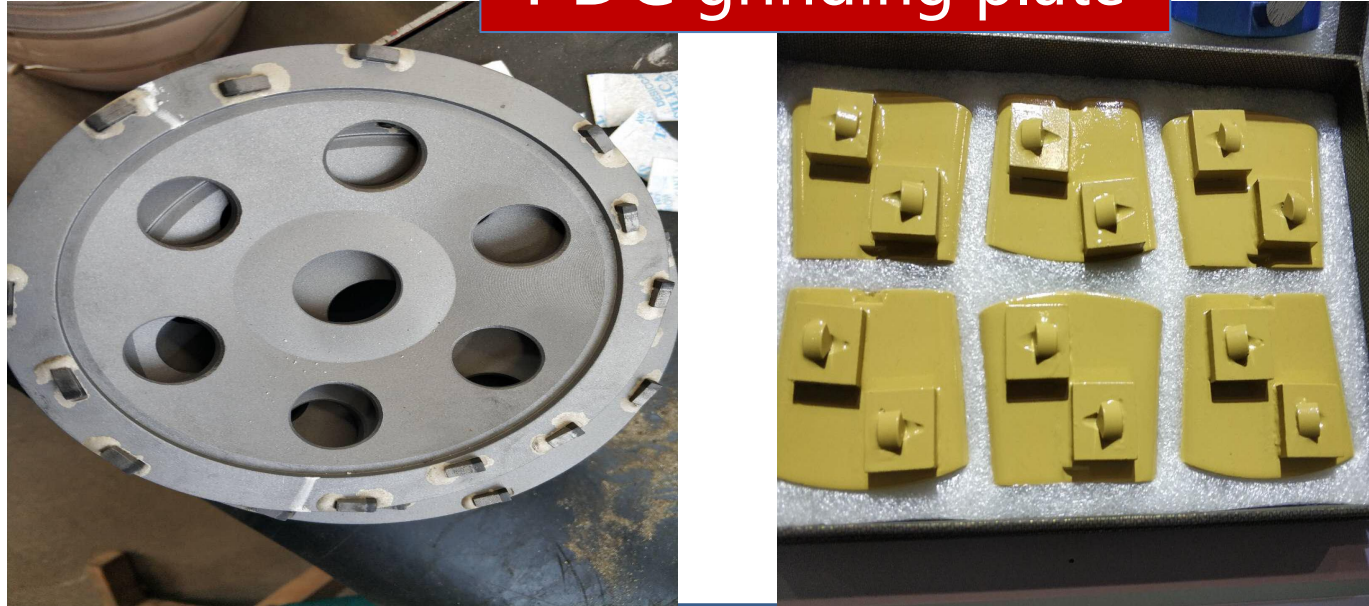


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II. Products introduction-PDC grinding plate

PDC grinding plate



Application fields: removing the paint, glue, epoxy resin and the floor coating, high quality, high efficiency, long service time.

Appllication: Husqvarna, HTC, Scanmaskin, Terrco, and so on.

Connecting ways: $\phi 16\text{mm}$, $\phi 20\text{mm}$, $\phi 22.23\text{mm}$, M14, M16, 5/8-11, instant connecting.

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III. Products application- Coal mining

Coal
mining



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III. Products application- Coal mining



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III. Products application- Geological exploration



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Geological exploration



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III. Products application- Geological exploration



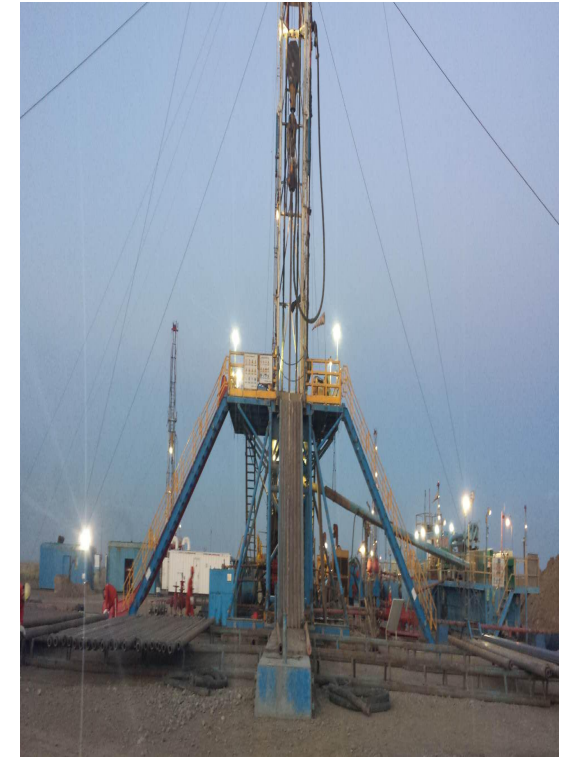
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III. Products application- oil drilling

Oil drilling



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III. Products application- oil drilling



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III. Products application- ground grinding



Ground grinding



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III. Products application- ground grinding



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III. Products application- ground grinding

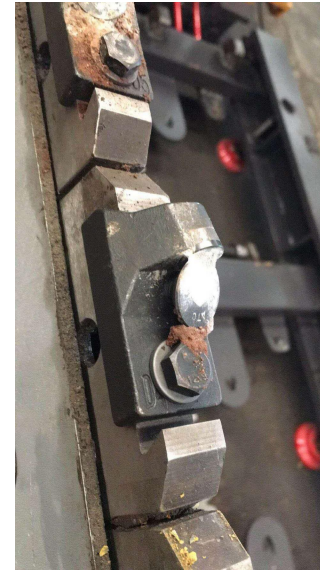
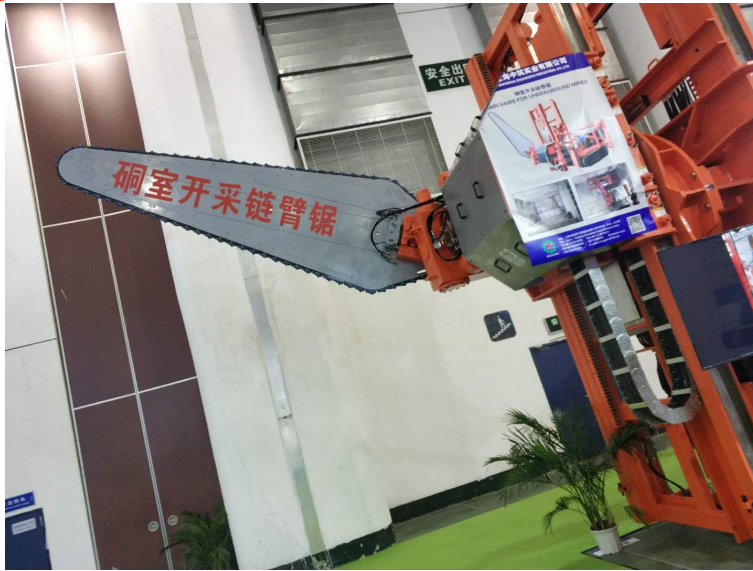


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III. Products application- stone cutting

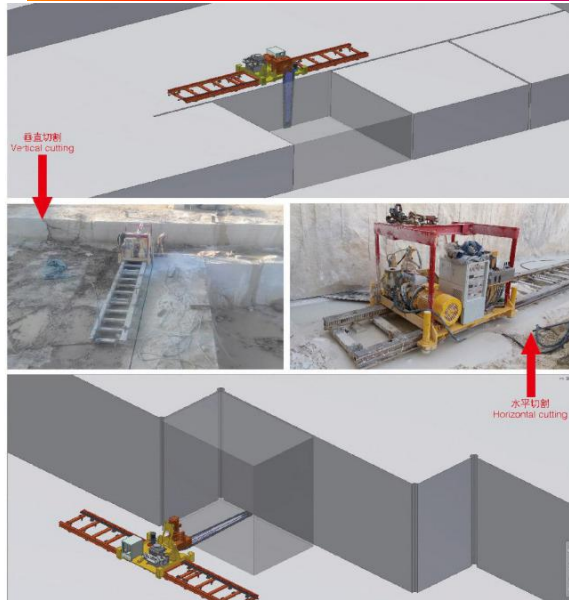


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III. Products application- stone cutting



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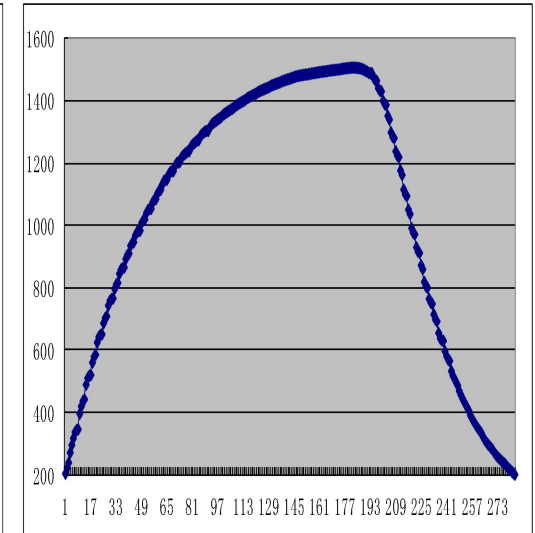
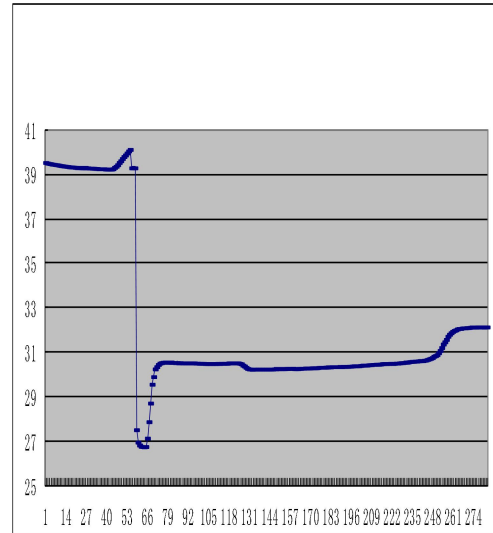
V. After-sales Service &Tech Support

III. Production Advantage

Equipment & technology advantages



**Own the self-researched new
large-ton six cylinder
synthesizing machines**



Mark the temperature and pressure during the high-pressure synthesizing process with pressure & temperature test technology, fulfill the accurate control.

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III. Production Advantage- production equipment



Production Capability

Monthly output is **1 million pieces**, provides stable supply assurance

Customised Machining

- ❑ Multiple post-processing equipments and provide differential processing plans according to customers' requirements
- ❑ 30 pieces of laser cutting machines, 10 pieces of wire cutting machines

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III. Production Advantage- test equipment



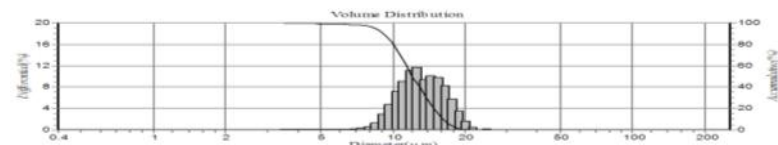
Perfect quality test system + Advanced test equipment+ Whole process quality control

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III. Production Advantage- test equipment

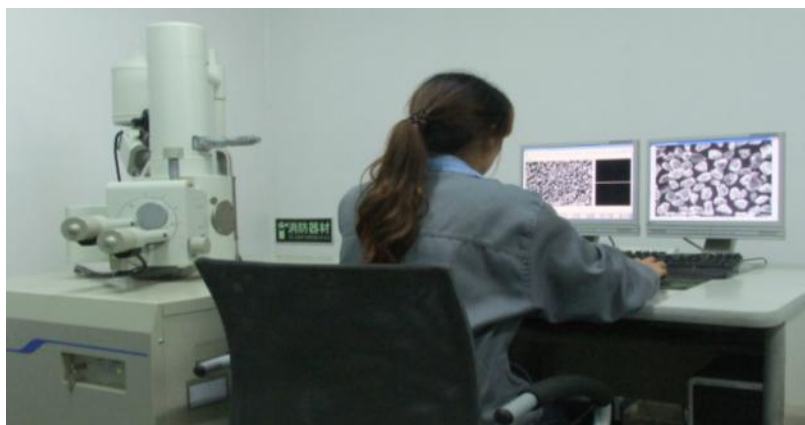


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diam (μm)	diff (%)	accum (%)	diam (μm)	diff (%)	accum (%)	diam (μm)	diff (%)	accum (%)
1.00	0.00	100.00	6.15	0.20	98.88	37.83	0.00	0.00
1.16	0.00	100.00	7.16	0.40	98.48	44.01	0.00	0.00
1.35	0.00	100.00	8.33	1.21	97.27	51.21	0.00	0.00
1.57	0.00	100.00	9.69	6.83	90.44	59.58	0.00	0.00
1.83	0.00	100.00	11.27	17.44	73.01	69.31	0.00	0.00
2.13	0.00	100.00	13.11	25.47	47.53	80.64	0.00	0.00
2.48	0.03	99.97	15.25	22.07	25.46	93.82	0.00	0.00
2.89	0.08	99.88	17.75	18.17	7.29	109.16	0.00	0.00
3.36	0.10	99.78	20.65	6.45	0.84	127.00	0.00	0.00
3.91	0.16	99.62	24.02	0.63	0.21	147.76	0.00	0.00
4.54	0.25	99.37	27.95	0.21	0.00	171.90	0.00	0.00
5.29	0.29	99.08	32.52	0.00	0.00	200.00	0.00	0.00

Particle size distribution of micro powder



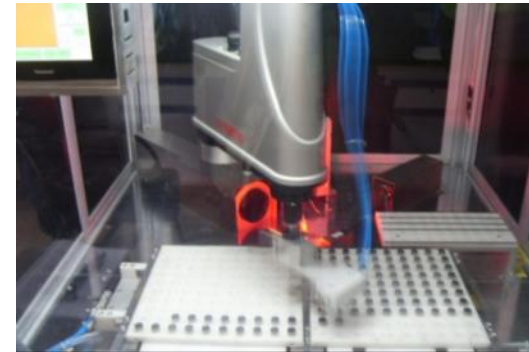
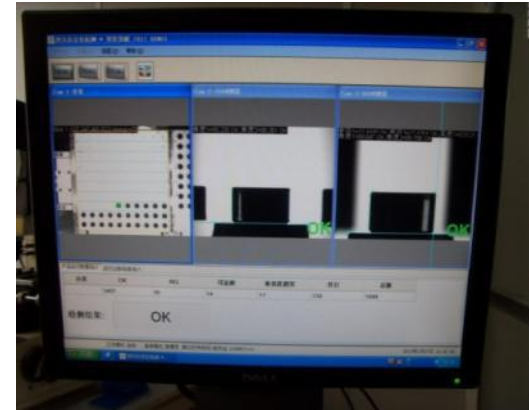
Particle size and crystal form of micro powder
(SEM)



Micro powder purity
(conductivity meter)

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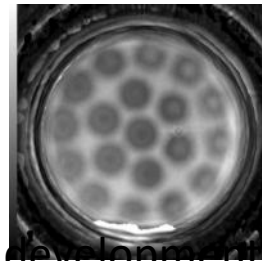
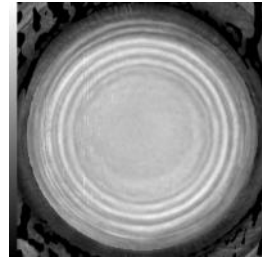
III. Production Advantage- test equipment



- Automatic dimension measuring machine (add vedio)
- Test the diameter, height and perpendicularity with auto-sortor
- Detection precision: size 0.01mm

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III. Production Advantage- test equipment



◆ Ultrasonic scanner

Analysis the PCD layer height and defect inside

Penetration development detection

◆ Penetration detection

Analysis the product surface and edge crack

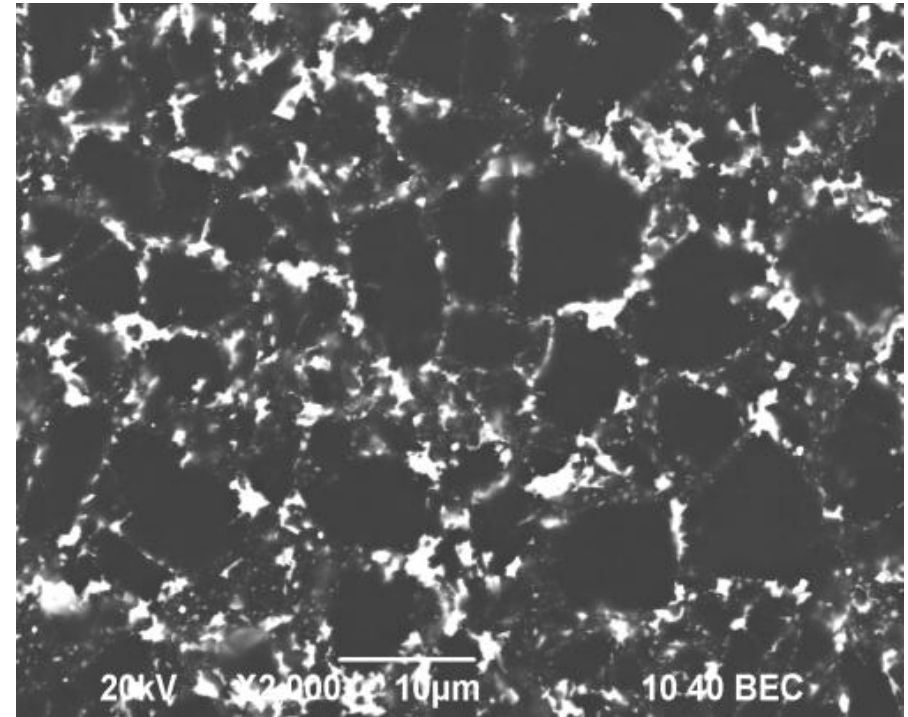


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III. Production Advantage- test equipment



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◆ SEM Scanning electron microscopy

Enlarge 300 thousand times, analysis the micro structure to learn the sintering condition and the location of binding agent

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III. Production Advantage- test equipment

◆ Wear resistance test

- Grind the granite by digital controlled vertical lathe with constant wire speed, adjust the test parameter according the bits' actual usage condition.
- Presently all the foreign large-scale PDC and bits manufactures are all use this test platform.
- Wear resistance test and be divided into two kinds of dry and wet, which can test the wear resistance and heat resistance.



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III. Production Advantage- test equipment

Heat stability test—Carbonizing the products by high-speed whirl-turning, analysis the heat stability according to turning journey length

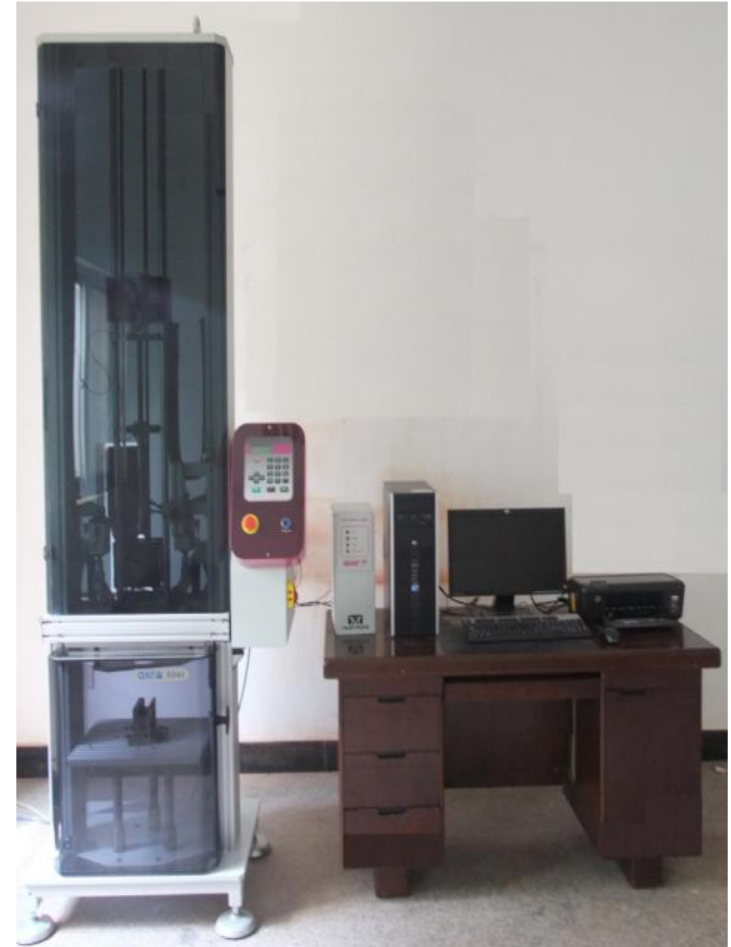


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III. Production Advantage- test equipment

- ◆ **Impact resistance test**
- ◆ Test the maximum impact resistance of products
- ◆ Test the accurate energy and wire speed during the impact
- Adjust the parameter according to the bits' actual usage conditions, stimulate the PDC's true drilling situation.

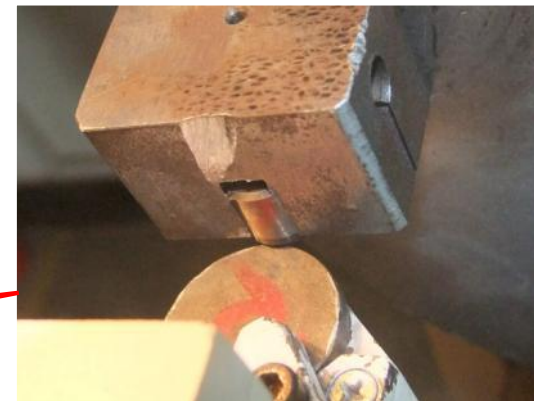
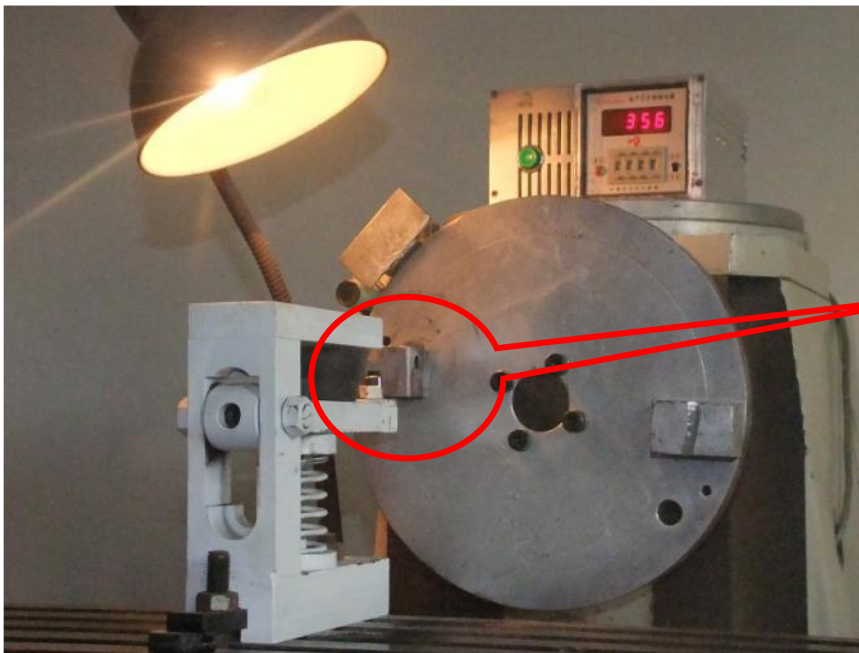


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III. Production Advantage- test equipment

- ◆ Anti-fatigue impact test
- ◆ Test the anti-fatigue impact on the product surface, adjust the impact frequency upon the usage, stimulate the PDC' s usage.



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V. After-sales Service & Tech Support

After-sales service & technology support

After-sales support

- ❑ After receiving the problem feedback, we will arrange the technology engineer to analysis the site-usage situation and get the solution.
- ❑ Visiting the customer regularly, to know the usage condition and products improvement requirements, introduce the new products & research direction.

Technology support

- ❑ Supply ready telephone support during the working time
- ❑ Send the technology engineer to proceed face to face communication guide according to the requirements.
- ❑ recommend and research the corresponding products according to customers' actual working condition.



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Expect to your cooperation !

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