The Product Catalogue

---- From Nina

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---ZY Tools Tech International Department

Zhengzhou Zhongyuan Super Hard Tools Co.,Ltd

Primary PCD Markets

- **Automotive: Transmission** Housings and Valve Bodies; Manifolds; Cylinder Heads; Wheels; Pistons; Oil, Water, Power Steering and Fuel Pumps; Brake Cylinders; Carburetors; Engine Blocks; Alternator, Starter and Air Conditioning Housings
- **Pumps/Valves :**Housings, Moving Parts
- **Home Appliances: Housings**/Compressor Pistons
- **Aircraft/Aerospace: Cowling**, Wing Tips, Ducts, Floor Posts, Structural Components, Trim Panels
- **Electrical Machinery:** Commutator Shafts/Housings
- **Computer and Electronic :** Moving Discs; Mirrors/Lenses

PCD cutting tools classification

1. Pcd wheel hub turning tools
2. Pcd external threading tools
3. Pcd Acrylic Window Bit
4. Pcd Reamer
5. Pcd Fine Boring Tools
6. Pcd Milling Cutters
7. Pcd Drilling Tools
8. Pcd Dressing Tools
9. Pcd Wood Cutting Tools
10. Adaptors Etc
11. Usually we do as the drawing by customers offered.
12. Introducing some pcd tools as follows:

汽车制造行业
Automotive Industry

汽车行业发展现状 / Automotive Industry Situation

近年来，中国的汽车零部件企业在高速增长，同时越来越多的跨国汽车零部件公司在中国设立了独资企业，目前全球排名前100位的汽车零部件供应商中有70%已经来华开展业务。面对汽车市场的高速增长和激烈竞争，各汽车零部件制造厂家在不断提高质量和性能的同时，更加关注部件加工的效率和成本，PCD/PCBN刀具恰好满足了客户的加工需求，市场前景越来越好。我公司致力于PCD/PCBN刀具16年，在汽车行业拥有丰富的加工应用经验，目前我们产品在国内已经覆盖92.5%的汽车发动机行业，在市场上已经占领了不可取代的地位。

汽车制造行业
Automotive Industry

In recent years, Chinese automotive parts industry develops fast. Besides, more and more multinational automotive companies set new factories in China, now 70% of the top one hundred automotive industries in the world have business in China. Facing so potential and competitive marketing, all automotive industries pay more attention to efficiency and cost of the component while improving quality and function of component, PCD/PCBN cutting tools become the key-point of the machining. Our company is specialized in PCD/CBN tools for 16 years, and we have gained rich experience in automotive application, now we have covered 92.5% automotive industry in domestic market, what's more, we got the irreplaceable position in tool market.

汽车制造行业
Automotive Industry

孔加工用刀具 / Tools for Bore Machining

聚晶金刚石（PCD）刀具材料高硬度、良好的耐磨性等特点特别适合有色金属加工，发动机行业中，缸盖大多采用压铸铝的方式制造，因而PCD刀具可充分发挥其优越的加工性能，其使用量日渐增长。在导管孔、座圈底孔、凸轮轴轴承孔、火花塞孔的加工中，保证同圆度、同心度、表面精度和光洁度非常关键，我公司推出的PCD刀具性能、指标稳定，可完全满足客户的各种需求，同时能为客户提供全面、优质的技术。

At present, almost all cylinder heads are made of aluminum. That is why PCD tool is the best choice for machining cylinder heads and its application amount is also going up. However, when machining valve seat and valve shaft guide, it is very strict on spark plug hole, high precision camshaft bearing hole. As we all know, the roundness, concentricity, surface accuracy and smoothness are very crucial to the function of valve seat and engine. Fortunately, PCD tools produced by Zhengzhou Diamond not only can meet such exact demands, but superior technology service is also provided for clients.

产品系列 Products series

HSK/RTS连接方式铰刀 HSK/RTS Connecting Reamer
PCD成型复合刀具 PCD Compound Form Tool
PCD可调式镗铰刀 PCD Adjustable Boring & Reamer Tool
PCD焊接/合金钻头 PCD Brazed Drill / Carbide Drill
PCD枪铰刀 PCD Gun Reamer

汽车制造行业
Automotive Industry

RTS系列刀具 / RTS cutting tool

RTS（Replaceable Tapered System）-可换式小锥柄刀具系统，主要是针对小孔系列，异形系列，小尺寸面的加工，解决了汽车零部件行业中个别部件加工难的问题。RTS刀具系统主要有三个部分组成：小锥柄PCD/CBN铰刀/铣刀，带有切削液通道的双头螺钉，转接柄。RTS加紧系统有切削液通道，操作简单，使用可靠，夹持精度高，可夹持PCD、PCBN、涂层等高精度刀具。我们已获得了可换式小锥柄刀具系统的实用新型专利，在生产线上已经开始批量生产，赢得了广大客户的好评。

RTS（Replaceable Tapered System）is designed for small bore, complex part and small dimension face machining, and it solved the difficult machining problem for some special component. RTS system is formed by small tapered PCD/PCBN reamer & milling tool, double-thread screw with coolant fluid channel and connection holder. RTS system can be operated easily and conveniently, and it can clamp PCD/PCBN and coating tools with high precision. Now we have got national utility model patent and produce RTS tools in batch, more importantly, we get more and more high praise from our clients.

设计因素

- 锥面接触以达到定位准确。
- 要求连接强度高，以达到精准和刚性好。
- 冷却液恰好喷到切削刃上，以满足客户冷却和排屑要求。

Design factors

- Taper connecting is helpful to fix position
- High connecting strength contributes to the accuracy and rigidity
- The coolant is sprayed onto the cutting edge exactly which meet the cooling & chip removal requirements

优点

1. RTS连接方式精度高，可批量生产，为客户备库存以节约时间。
2. 刚性高，抗震性好，提高了加工件的精度需求。
3. 刀具可调，精度和同圆度小于3μ。

Advantages

1. RTS connecting tool has high accuracy and can be produced in batch which can help client save time on making stock.
2. High rigidity and strong vibration resistance improve the accuracy of workpiece.
3. Tool is adjustable , thus accuracy and roundness can be less than 3μ.

汽车制造行业
Automotive Industry

新型气门阀座复合刀具 / Valve seat compound tool

气门座圈和导管孔的加工精度直接影响到发动机的动力和尾气排放指标， 如何能实现一把刀具轻松解决两个复杂结构工件的精密加工？为此我们推出了新型气门阀座复合刀具。它不会为您带来反复调刀、磨损变形快、加工效率低等困扰，同时可精准保证气门与座圈的配合间隙，确保气门散热和密封性能。

Valve seat and guide hole machining accuracy directly affect the power of the engine and gas emission. At present, the tool market faces such problems, like slow speed, low productivity, long delivery date and easy deformation. In view of the above-mentioned circumstances, Zhengzhou Diamond devotes to the new tool of R & D and manufacturing and has successfully developed new processing valve seat tools.

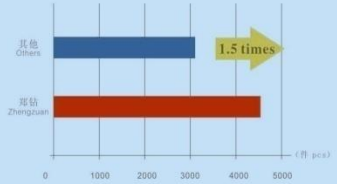
优点

- 结构简单，让使用者非常容易操作。
- 可换性强，使用者可以在短时间内调试刀具。
- 合理的内部冷却液流向设计，提高了刀具的寿命。
- 精度达到2μ，极大地提高了加工件的性能。

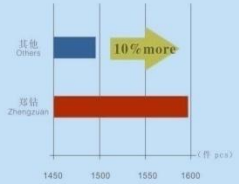
Advantages

- The structure is simple for users to operate.
- It is easy for users to adjust tools within a short time.
- The reasonable design of internal coolant flow can improve the tool life.
- The accuracy can be reached 2μ,which can greatly improve the performance of the work piece.

PM阀座进气PM Valve Seat: Intake



PM阀座排气 PM Valve Seat: Exhaust



汽车制造行业
Automotive Industry

机夹式镗刀 / Boring tool with adapter

机夹式镗刀系公司推出的新品，采用高强度、高刚性材质制作，广泛应用于机械加工行业，针对孔系零件加工，装夹精度高、使用性能稳定。

Our new product boring tool with adapter is made of high strength and rigidity materials, which is widely used in the machining industry. It is mainly used to process components with bores in stable performance and high precision clamping.

设计因素及优点

1. 采用机夹式可换刀片，刀片可修磨可更换，节约了刀具使用成本。
2. 刀片后端设计有微调结构，通过对微调整结构的调整，达到预设定的切削直径和背锥，保证孔径的加工尺寸，有效减少和避免出现加工震纹的现象。
3. 刀具可在专用预调仪及其他仪器检测、调试，加工过程中增加冷却液流量和分布位置，可对尺寸公差进行修正补偿，有效提高刀尖使用寿命，提高加工表面质量。
4. 法兰部位与HSK连接方式， HSK刀柄能够实现与机床主轴高精度装夹，刀具采用了陶瓷导向条结构支撑定位，有效增强切削刃的稳定性；减小加工过程刀具振动， 同时刀具自行导向，可增加刀具刚性，提高生产效率。

Design factors and advantages

1.Using indexable inserts which can be reground and changed to save tool cost.

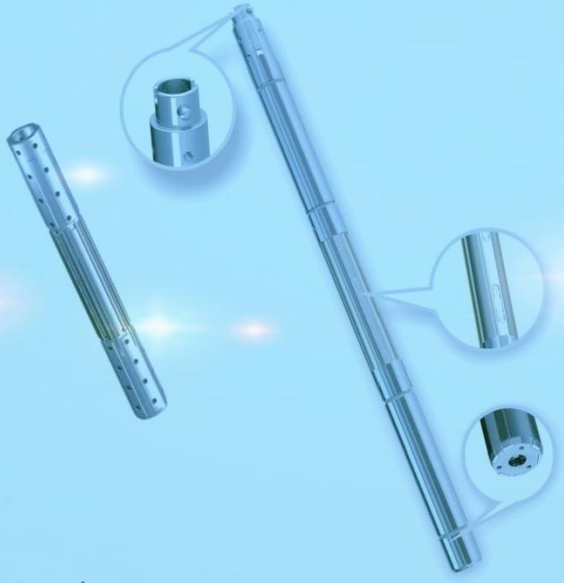
2.The back-end of inserts is designed into fine-tuning structure. By adjusting of which can achieve the pre-set cutting diameter and back cone and guarantee the size of the aperture processing, and effectively reduce and avoid vibration.

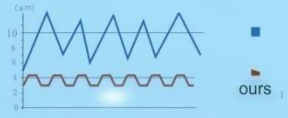
3.Tool can be tested and adjusted on presetter and other instruments. During the processing, it can increase coolant flow and distribution, as well as compensate and correct dimensional tolerances. Thus tool tip life and the quality of the machined surface can be improved effectively.

4.With flange and HSK connection, high precision clamping between HSK tool holder and machine tool spindle can be achieved. The tool is adopted ceramic guide bar structural support positioning, effectively enhancing the stability of the cutting edge and reducing vibration. Besides, the tool can be self-oriented which increase tool rigidity and improve production efficiency.

汽车制造行业
Automotive Industry

珩磨铰珩杆 / Honing rod





加工件圆度、精度、粗糙度监测图
Roundness, precision and roughness inspection

在时间段内，磨损监测图显示我们的珩磨产品表现出超高的稳定性。
Precision can be kept in 3~5 μm within a period of time. Our honing tools showed great high stability.

汽车制造行业
Automotive Industry

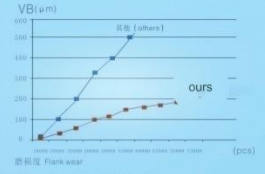
枪铰刀 / Gun reamer

应用于钻孔、扩孔、粗铰孔、精铰孔及抛光工序。我们在现有传统枪铰刀基础上，改变刀具材质及结构，设计开发出一种其性能和寿命均超过硬质合金枪铰刀的刀具产品，PCD枪铰刀非常适合自动化生产线加工节拍，有效改善了加工质量，是铰削细长孔径的优先选择。

Gun reamer are widely used in broaching, rough & finish reaming, polishing, etc. On the basis of traditional gun reamer, by changing the tool material and structure, our company designed a new cutting tool which can replace carbide gun reamer. Thus the new tool can achieve a long tool life, improve the cutting quality, be more suitable for work cycle, and meet the requirements of high efficiency and high precision machining.

枪铰刀加工缸盖案例
Case : Gun reamer for machining cylinder head

工件名称 Work piece	液压挺杆孔 Hydraulic lifter bore
材料 Material	铝 Aluminum
刀具 Tool	PCD枪铰刀 Gun reamer made oy
条件 Condition	盲孔 Blind bore 断续加工 Interrupted machining
技术参数 Technical data	主轴转速 Spindle speed =15000 rpm 进给 Feed=0.09 mm



与竞争对手加工件数量和磨损程度对比图。我们的珩磨产品表现出超高的稳定性。
Machined workpiece qty and wear out comparison chart with competitor. Our honing tools showed great high stability.

汽车制造行业
Automotive Industry

PCD立铣刀 / PCD end mill

PCD立铣刀：在现代制造业中，PCD立铣刀还没有引起足够的关注。主要原因是目前大量使用硬质合金铣刀，但是硬质合金磨损太快，几何形状容易变形，切削刃口不能做圆弧，我司针对此问题选用PCD为材质，有效的解决了以上问题。目前郑钻PCD立铣刀已经批量生产，以高质量高效率的标准赢得更多客户。

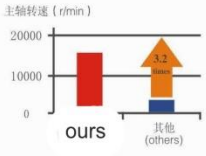
Currently, PCD brazed end mill are still attracted a little attention in modern machining equipments, the main reason is that there are too much solid carbide end mills in the marketing, but everybody knows that the wear resistance of solid carbide end mill is not good, and distortion in geometry happened on the forms, besides radius and corner cannot be made on solid carbide end mill. So PCD end mill is very potential in our modern machining marketing. Now our company can make PCD end mill in large quantity, of course, it is the quality, not quantity that makes us win.

优点

1. 可修磨，降低成本。
2. 耐磨性好，刀具寿命长。
3. 标准化生产，减少客户的库存量。

Advantages

1.PCD end mill can be reground to help customers reduce cost.
2.Good wear resistance and long tool life.
3.Standard production could reduce clients' stock.



汽车制造行业
Automotive Industry

PCBN立铣刀 / PCBN end mill

随着时代的发展，越来越多的难加工材料不断涌现，因此我公司不断地研发和创新，成功地制造出了PCBN立铣刀，PCBN刀具有很高的硬度、耐磨性和良好的热稳定性等，而且符合高速切削、干式切削、硬态切削等绿色制造的要求。

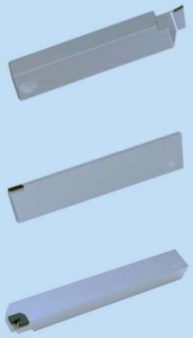
Now machining equipments are developed very quickly and more and more hard-machined material come up, so our R&D work very hard, and we produce PCBN end mills successfully. PCBN end mills have many advantages, such as high hardness, good wear resistance and stable thermal stability, etc, which are good for high cutting speed, dry cutting, and so on.

PCBN立铣刀与硬质合金刀加工效率及技术指标对比（在HT250材料上加工Φ10.8×38孔）
Comparison of technical data between PCBN end mill and solid carbide end mill
Workpiece material: HT250
Workpiece part: bore of Φ10.8×38

对比参数 Technical data	硬质合金刀具 Solid carbide end mill	PCBN刀具 PCBN end mill
转速（r/min） Spindle speed	5,500	18,000
进给量(mm/min) Feed	1,100	5,000
粗糙度（μm） Roughness	1.6	0.4
底面平行度（mm） Bottom parallelism	0.01	0.005
侧面平行度（mm） Side parallelism	0.012	0.005
刀具耐用度（件） Tool life	<80	≥120

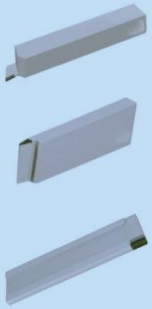
汽车制造行业
Automotive Industry

槽型加工 / Grooving machining

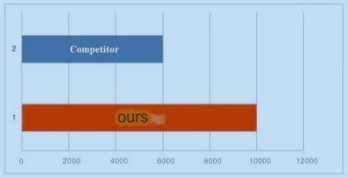


PCD/PCBN槽刀系列可用于加工活塞环槽，由于活塞在高温高压高耐磨的条件下工作，对其轮廓精度和表面粗糙度要求极高。刀具在加工过程中具有精度高，耐磨性好等特点。

PCD/PCBN grooving tool series can be used for processing ring grooves of piston. Because of high temperature, pressure and wear resistance working condition, piston processing requires high outline precision and roughness of surface. PCD/PCBN grooving tool series can satisfy these strict demands with perfect processing performance.



Workpiece & Processing: O.D. turning of Aluminium pistons 加工工件以及加工方式： 铝制活塞外径车削
Material: 390 Al (GD-AL Si17) 材料：390 Al (GD-AL Si17)
Tool Name:Grooving tool with CKD13 刀具名称： 槽刀 PCD材质为CKD13
Machining Parameter: Cutting speed: 370m/min Feed rate: 0.45mm/rev 加工条件： 加工速度：370m/min 进给率：0.45mm/rev
Coolant: Emulsion 冷却剂： 乳化切削液
Testing result: 10000 pcs per setup 使用结果： 10000件/刃

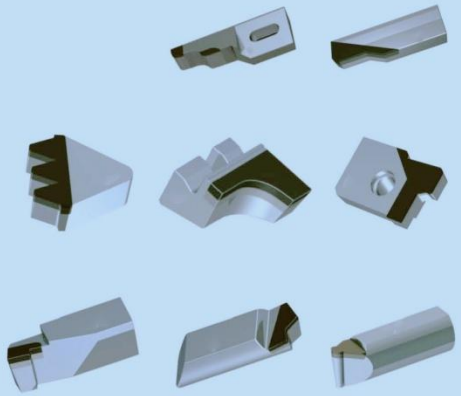


汽车制造行业
Automotive Industry

成型刀片 / Special inserts

在汽车行业发展中，零部件的形状、结构日益多样化。为此我们推出了一系列成型刀片，针对性解决零部件特殊的加工形状，加工要求，一次成型，加工效率提高，单个零部件加工成本降低。

With the fast development of automotive industry, the form and structure of components are going to be more diverse. Therefore, we launched series special inserts which could meet exact demands on components form and machining request. Once-formed machining could also improve the efficiency and reduce cost.



我们的服务Service

1. 全天候服务 24-hour service
2. 新项目解决方案 New project solution
3. 现场问题解决 On-site solution
4. 按客户要求备货 Stock service according to clients' requirement

优点Advantages

效率高，为客户节省加工时间。High efficiency makes machining time shorter.
性能稳定，为客户提高加工件质量。Stable performance improves the workpiece quality.
结构简单，用户便于操作。Simple structure is easy for clients to use.

ours

医疗行业
Medical Industry

随着现代医疗行业的发展，假肢的应用日益广泛，人们对假肢的材质和质量要求越来越高，我们针对性地开发了一系列适合于假肢各关节精密加工的医疗器械刀具，连续多年出口日本，产品口碑和服务赢得了客户的一致认可。

With the development of science and technology, prosthetics also have rapid development in the medical industry. The application of PCD tools in the medical industry improves processing efficiency and reduces the cost. We export our medical cutters to Japan for many years and have won the trust of the clients with our high quality.

我们的优势

1. 精度≤3μ，提高假肢部件精确度，解决客户安装难题。
2. PCD刀具寿命是普通合金或者涂层刀具的4~5倍，有效降低了刀具成本。
3. PCD刀具是加工钛合金最佳选择。

Our Advantages

1.The precision≤3μ,which improves the accuracy of the prosthetic workpiece and solves the installation problems.
2.The PCD tools life is 4 to 5 times longer than the carbide tools or coating cutting tools.
3.PCD tools are the best choice to machine titanium material.

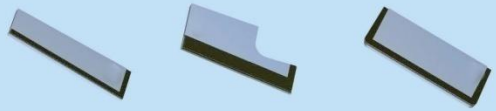
医疗行业
Medical Industry

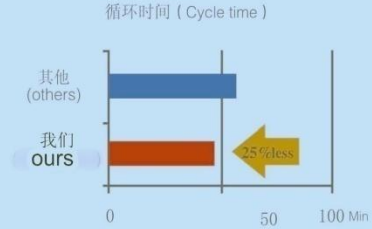
设计因素

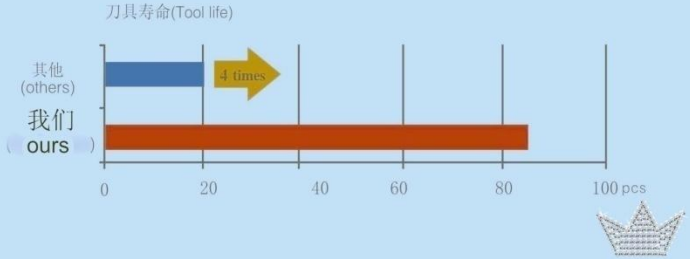
1. 降低切削热量
2. 提高加工生陶瓷难加工材料的使用寿命
3. 加大切深，提高加工效率

Design factors

1.Reduce the cutting heat.
2.Prolong the life of machining titanium material.
3.Increase the cutting depth and improve the machining efficiency.



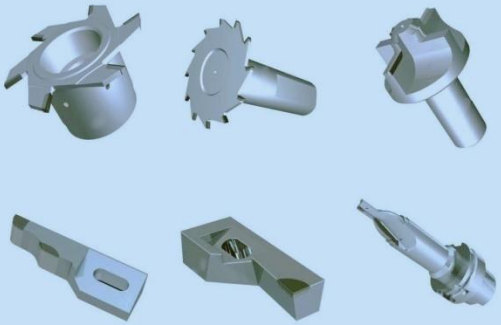




精密机械加工行业
Precision Mechanical Machining Industry

随着CNC技术的发展，切削加工作为重要的生产力呈现出高效率、高速度、高精度的发展特点。PCD/CBN刀具在制造业切削加工中承担精密加工的重要任务，尤其在精密机械加工行业，PCD/CBN刀具表现出绝佳的加工性能和较长的使用寿命不断地满足着更多的行业。空调压缩机行业、精密电子制造行业，我们为产品应用效果不但满足了客户的加工要求，优质的技术支持直接为用户提高了生产效率。

With the development of the CNC machine, the cutting tools have entered the period of high efficiency, high speed, and high precision. PCD&PCBN cutting tools play a very important role in the modern cutting technology. They can meet the high efficiency, good stability, long life requirement, especially in the precision machining. Our tools have achieved prominent success in the air-conditioning compressor industry and other electronic industry, the application result not only meet the machining requirement but also improve the efficiency for clients.



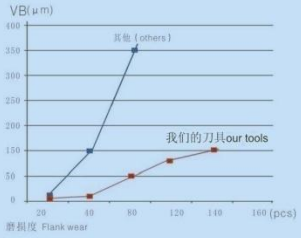
案例分析：Application Example

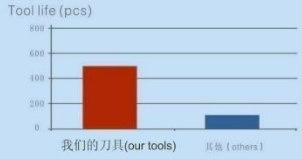
工件名称 Work piece	空调压缩机动盘，静盘 Air-conditioning compressor driving disk, stator
工件材质 Work piece material	灰铸铁 Gray cast iron
切削参数 Cutting parameters	主轴转速 Spindle speed 18000r/min
	切深 Cutting depth 0.25mm
客户预期 Customer expectations	粗糙度达Ra1.6，加工件数80 Roughness:Ra1.6, workpieces qty:80
实际效果 Result	粗糙度达Ra0.4，加工件数＞140 Roughness:Ra0.4, Workpieces qty: ＞140

精密机械加工行业
Precision Mechanical Machining Industry

案例分析：Application Example

工件名称 Work piece	电机外壳 Electric motor housing
工件材质 Material	珠光体灰口铸铁 Pearlitic grey cast iron
技术参数 Technical data	切削速度 Cutting speed =1000m/min 进给量 Feed rate=0.33mm/rev 切深 Cutting depth=0.1mm

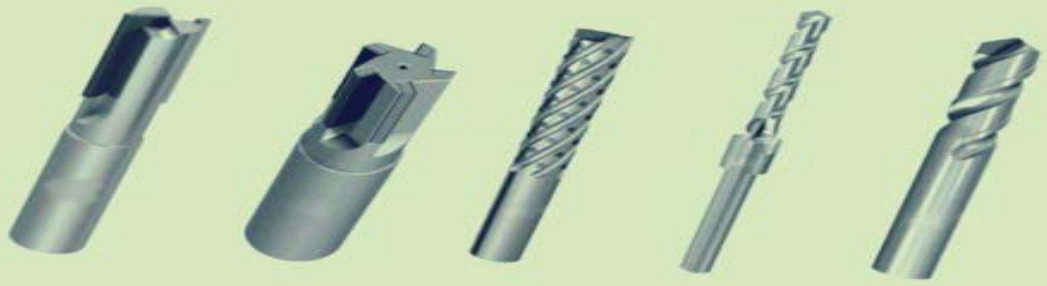




航空航天制造专用刀具系列
Aerospace Cutting Tool Series

在航空制造领域，对飞机配件材料提出的要求既要安全可靠，又要尽可能轻量化，轻型材料是最佳的选择，但其加工过程难度大，对切削刀具本身要求很高，普通合金刀具在加工中极易出现磨损快，孔口残余毛刺等问题，无法满足高效、高精度的加工要求。PCD刀具因其材料本身的高硬度、高耐磨性等特点，能很好地满足轻质复合材料的加工要求，其推广应用将成为该领域加工技术发展的必然趋势。

In the field of aerospace manufacturing, the materials of aircraft accessories must be stable and weight-reduced. Thus, to process such light-weight materials turns out to be a problem.The alloy tool wear faster and the orifice is prone to burr which cannot meet the processing needs. While the application of PCD tool happens to be able to solve those processing problems.Therefore, PCD tool in the aerospace manufacturing industry is a challenge but will also be a trend.



PCD刀具应用的优点

1. 寿命长，降低客户加工成本。
2. 孔口无毛刺，提高加工工件的表面质量。
3. PCD中心钻头，排屑更顺畅。
4. PCD钻头集粗、精加工于一体，钻削、铣削配合使用，节省加工时间，提高加工效率。
5. 产品可根据客户需求量身定制。

Advantages of PCD tool applications

1.Long life reduces the processing cost of clients.
2.No burr improves workpiece surface accuracy.
3.PCD center drill is good for chip removal.
4.PCD drill can be applied to both roughing and finishing. With drilling and milling used together, it can improve work efficiency & reduce machining time.
5.Products can be customized.