

## Airframe, wing and empennage

High-strength aluminum alloy, CFRP, GFRP,  
Honeycomb material

# Cutting tool solution for aviation materials



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Airframe, wing and empennage

CFRP  
GFRP  
SiCp/Al



Aviation materials is the base for making aviation products and the cutting tool is the important technological base for meeting customers' expected product requirement, like the technical performance, working life and the reliability.

Zhengzuan has adopted carbide tools, PCD tools and diamond coating tools, which are good for the bore machining, surface milling and edge completion, etc. The tools are suitable for different kinds of machines, such as CNC machine, automatic feeding machine and manual drilling occasion. All kinds of standard and special cutting tool solution can be provided to customers.

## Tools for machining composite materials

Bore machining (Application range: Aluminum alloy)

### Countersink

With PCD edge tipped, the tool edge has the high durability and the component surface roughness is great after being machined.

The accuracy grade is 2A, the thread fit properly with conical surface, which guarantee the high accuracy of changing the tool quickly and simply.

The counter bore angle is with metric system: 100° and 130°, the American system standard tools can be supplied with all kinds of specifications.

The guide pillar diameter:  $\phi 2\text{mm} \sim \phi 16\text{mm}$



### 1. Integrated tool with function of drilling, reaming and countersinking

Bore drilling and countersinking can be completed at a time, so it omits the process of retracting, changing and transposing the tool, which reduce the machining time. Besides, with the margin polished, the bore wall can get burnished after being machined.

Diameter:  $\phi 2\text{mm} \sim \phi 16\text{mm}$

### 2. Twist drill

General type, cross shaped drill tip type

Diameter:  $\phi 2\text{mm} \sim \phi 20\text{mm}$

### 3. Taper drill

Special drill tip, small drilling axial force  
The sharp edge guarantee the great quality

Diameter:  $\phi 2.5\text{mm} \sim \phi 12\text{mm}$



# Tools for machining composite materials

Milling tool

## 1. Composite material milling tool A/B/C

Used for rough and finish machining Carbon Fiber Reinforced Plastic (CFRP) and Glass Fiber Composite Reinforced Plastic (GFRP), the helical edge is used for the plunge milling and side milling, which could effectively restrain layering and burrs.

Diameter:  $\Phi 3\text{mm} \sim \Phi 12\text{mm}$

## 2. Two-edge PCD endmill (Rough)

The tool with sharp PCD edge could cut the fiber material quickly with smaller cutting force, longer tool life and better surface quality. Central cutting is allowed to be with plunge milling and finish machining on the plane.

Diameter:  $\Phi 3\text{mm} \sim \Phi 20\text{mm}$

## 3. KEVLAR material milling tool

The special edge which is exclusively designed with KEVLAR material could well cut off the fiber and avoids the burr and material stratification.

Diameter:  $\Phi 3\text{mm} \sim \Phi 12\text{mm}$

## 4. Two-edge PCD ball nose milling tool



Tool expert by your side

# Tools for machining aluminum alloy

Milling tool

## 1. PCD high speed milling tool

PCD edge is sharp and smooth, which control the occurrence of built-up edge and other burrs to a minimum.

Cutting edge runout: 0.002,

With large chip storage space design, it guarantees the good chip removal and the heat dissipation, which can reduce the cutting impact and achieve quick cutting.

Diameter:  $\Phi 6\text{mm} \sim \Phi 32\text{mm}$

## 2. Carbide endmill

Ultra-fine grain carbide material,

The polished sharp edge is good for quick machining,

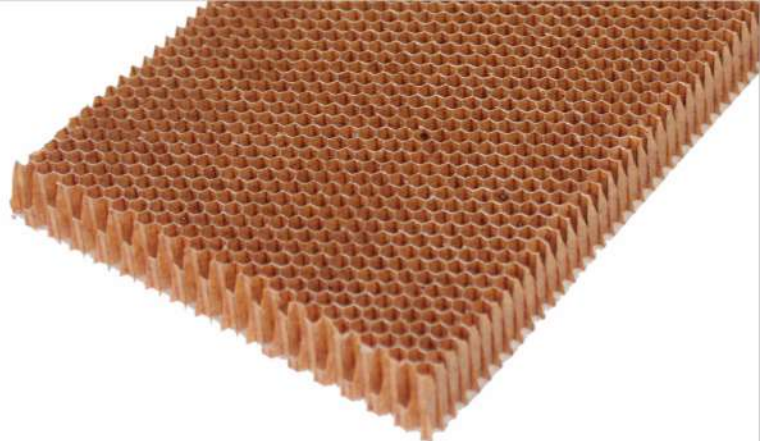
Large chip storage space is liable to chip removal.

Diameter:  $\Phi 6\text{mm} \sim \Phi 20\text{mm}$



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# Honeycomb materials



Honeycomb composite material with its great advantages of ultra-light weight, high strength and high durability has been extensively applied to the main and second load-carrying structure of aircraft, such as wing, fuselage, empennage, radome, floor and interior parts, etc.

## Ultrasonic machining

Using the energy of ultrasonic vibration to cut variety of composite materials, this application has been used in aviation material processing industry for more than 30 years since 1990s.

### 1. Integral ultrasonic disc tool

Sharper cutting edge and smaller bottom pressure can get a good machined surface which doesn't need any other processing before being bonded.

Diameter:  $\phi 12.7\text{mm} \sim \phi 19.05\text{mm}$  (1/2" ~ 3/4")

### 2. Straight edge ultrasonic tool

Sharp edge used for honeycomb material machining can avoid chippings.



### 3. Honeycomb smashed milling tool (2 parts structure)

Integrated tool shank design and helical flute cutting edge can achieve higher cutting speed and feed rate.

Diversified tool sizes cover various kinds of honeycomb core material processing, new smashed tool edge design make smaller resistance of chip removal.

Diameter:  $\phi 22\text{mm} \sim \phi 95\text{mm}$  (0.88" ~ 3.75")

### 4. Honeycomb smash milling tool (3 parts structure)

Quick removal of mass honeycomb core material design, 1 milling tool can meet both rough and finish machining, which ensure to get good surface roughness.

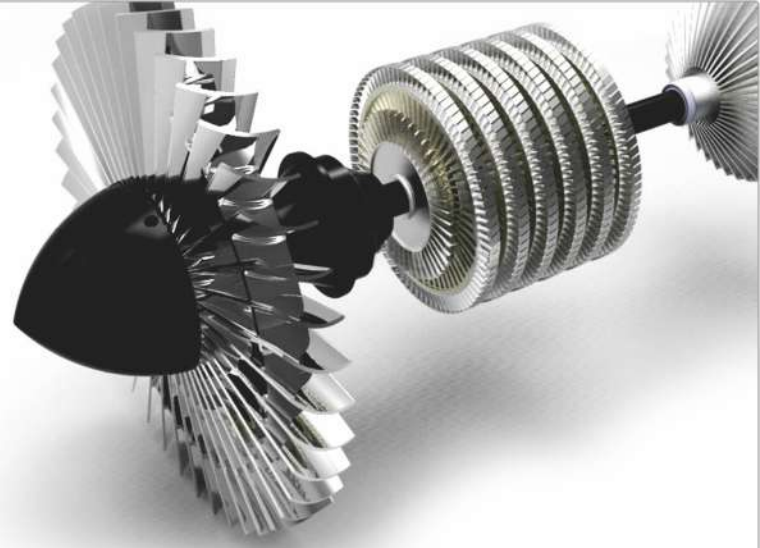
Diversified tool sizes cover various kinds of honeycomb core material processing, new smash cutter design make smaller resistance of chip removal.

Diameter:  $\phi 37\text{mm} \sim \phi 61.5\text{mm}$  (1.45" ~ 2.42")



# Hard processing materials

Milling tool



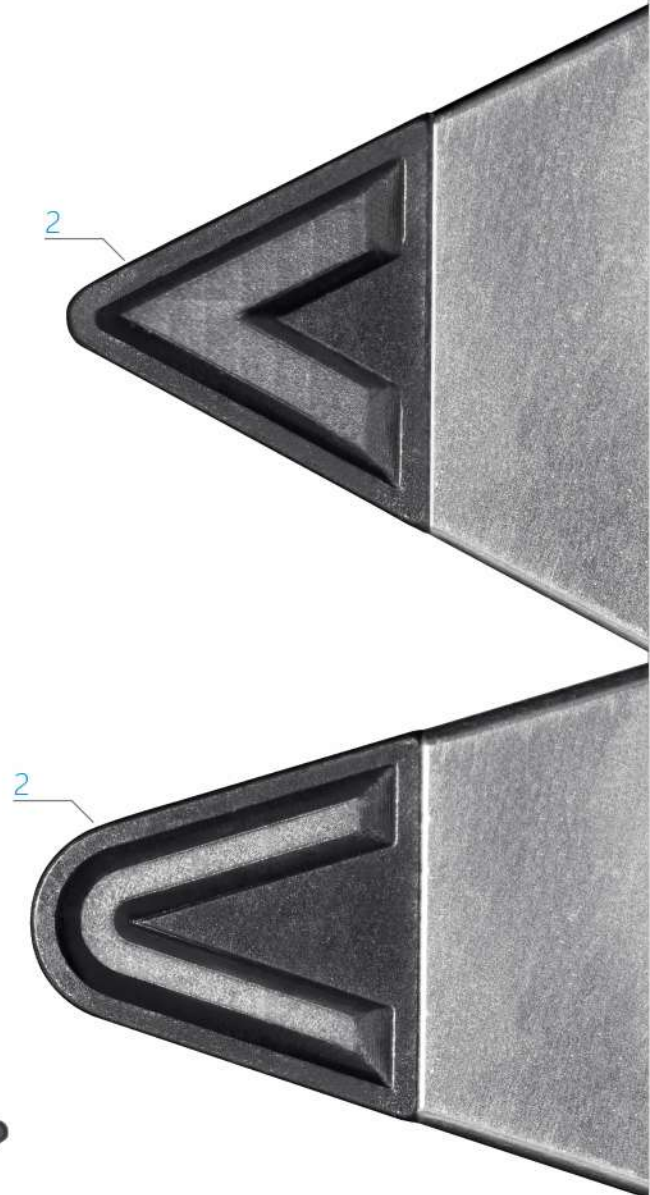
## 1. End mill (Titanium alloy machining)

Unequal helix angle, no vibration and more smooth cutting  
Suitable for rough and finish machining.  
Selected coating, longer tool life.

Diameter:  $\varnothing 3\text{mm} \sim \varnothing 20\text{mm}$

## 2. PCD inserts (Titanium alloy machining)

Sharp PCD cutting edge can get better surface quality and improve productivity.  
Longer tool life.  
Chip breaker optimizes chip control.





Tool expert  
by your side

**Zhengzhou Diamond Precision Manufacturing Co., Ltd.**

No. 198, the 7th Ave of Zhengzhou Economic & Technological development zone, Henan, China.

Tel: +86-371-60300918 Fax: +86-371-60300961

Email: intl@zhengzuanchina.com

www.zhengzuanchina.com

