



# PCD REAMER

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## Overview

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Sundi specializes in the development, production, and sale of precision tools made from ultra-hard cutting materials such as PCD (polycrystalline diamond) and PCBN (cubic boron nitride) and has successfully established a presence in both national and international markets. To economically process these ultra-hard cutting materials, we recognized early on the need to move away from the old manufacturing technology of grinding and adopt new technologies such as laser technology. Ultra-hard high-performance cutting materials play a crucial role in metal cutting production.

Precision tools made from ultra-hard cutting materials require extensive explanation, and their economical usage is only guaranteed when the cutting process and the cutting materials are properly aligned.

This is precisely where our main competence lies - in the production of precision tools made from ultra-hard cutting materials. These high-tech tools must be precisely aligned with the cutting process with the assistance of an experienced application engineer to fully exploit their optimal potential.

With over 10 years of optimization experience in the production industry, we consider this to be our strength.

During production, we offer consulting services with the assistance of our experienced application engineers. This close and mutual trust-based cooperation is the foundation of our success.



## Introduce of Material

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PCD (polycrystalline diamond) material possesses excellent compressive strength and heat conductivity. PCD is second only to single-crystal diamond in terms of hardness, and its wear resistance has been proven to be superior to both cemented carbide and high-speed steel (HSS), making it an exceptional choice for cutting tools.

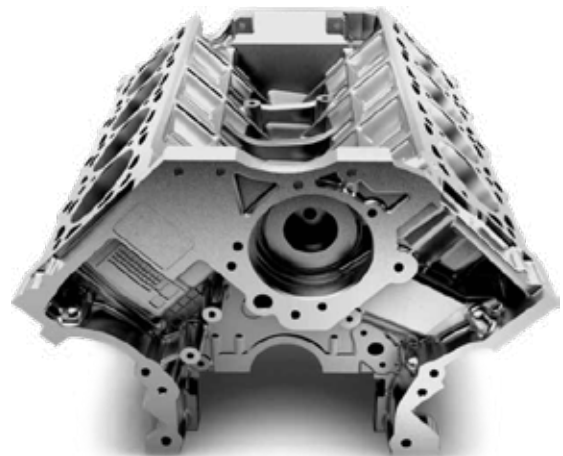
We source our PCD material from world-renowned companies, such as E6/GE, known for their consistent quality and performance.



## Applications of PCD Reamers

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- Automotive cylinder head.
- Hydraulic parts: AT valve body, regulator valve body.
- Steering spool, transmission housing.
- Other aluminum alloy parts (casting).
- Ceramic-containing composite materials such as MMC.



## Features and Advantages

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The PCD reamers have significantly higher cutting speeds and feed rates. Increased dimensional accuracy and process reliability.

Fewer process steps mean extensive freedom from burrs.

Through and blind holes for the integrated expanding screw in the tool point.

Optimal coolant delivery to the cutting edges.

The PCD reamers can facilitate fast clamping.

Ultra-long life of PCD tools.

Fewer tool changes which means a combination of multiple operations in one tool deliver savings on machine costs. Tool cost can be reduced by up to 50 % which means regrinding and reconditioning.



## Production and Process

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Our types of equipment comprised the finest name brands in the world, such as:

WALTER EDM device,

COBORN CNC Grinders,

Vollmer Wire Erosion Machines

ZOLLER measure machine

Schütte grinding device

With these devices, we can do a very complex job with perfect quality and performance

Generally the roughness of the cutting edge surface can reach  $RA \leq 0.2$ ,  
The tolerance can reach  $\leq \pm 0.002\text{mm}$ .



## Main Manufacturing Process

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1. Design the tools following the workpiece or customer's requirements.
2. Drawing confirmation.
3. Tool body making by CNC machining center or grinding machines.
4. PCD tips are bladed to the tool body by vacuum welding.
5. Making through or blind coolant holes to cutting edges by sinker EDM or CNC machining.
6. Machine the PCD blades by Vomeller 7-8 times.
7. Cutting edge process by Coborn based on customer's special demands.
8. QC and final testing reports.
9. All tools will be packed in plastic boxes.
10. UPS/DHL/FedEx/TNT delivery.











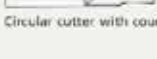

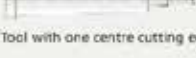

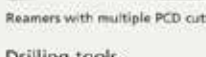



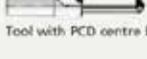




## Capacity

- Sundi designs and manufactures PCD solid reamers with integrated internal coolant, available in single or multi-step diameters depending on the application.
- For both boring and countersinking/counterboring, we offer a range of tools from simple designs to complex developments with various step profiles.
- Our tools are custom-made to meet specific customer demands, with different PCD grades, shoulder and edge cutting designs, number of teeth, sizes, and tool holders.



## A Wide Range of Top-Quality Products

Multi-stage tools (drilling, reaming, countersinking)	Milling tools	Tools with internal cutting edges (bell-shaped tools)	Tools with internal cutting edges (bell-shaped tools)
 Tool with one PCD tip/cutting edge	 Milling cutter with inclined inserted tips	 Multi-stage countersinking-reaming tools with internal profile	 Multi-stage countersinking reaming tools with internal profile
 Tool with multiple stages	 Milling cutter with helical PCD cutting edge	 Milling tools with internal profile	 Milling tools with internal profile
 Tool with multiple stages	 Profile cutter with U-profile	 Circular cutter with countersinking stage	<b>Milling cutter heads</b> 
 Tool with one centre cutting edge	 Circular profile cutter	 Reamers with multiple PCD cutting edges	<b>Tools with internal turning cutting edges</b> 
 Tool with helical flutes	 Ball radius cutter	<b>Drilling tools</b>  Tool with PCD centre bit	
	 Thread cutter	 Deep hole drilling tool	

## Engineers Design

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- Sundi's modern R&D facility is led by a team of experts, and we have a tool application testing center that contributes to tool innovation every year.
- With years of experience, our PCD reamers, manufactured at our production facility, are highly recommended by most clients for their ability to reduce costs by providing first and second steps, through and blind holes for integrated expanding screws in the tool point, and optimal coolant delivery to the cutting edges.
- Today, whether you realize it or not, many of the engineering products you see, feel, and touch in your everyday life have been produced with the help of Sundi, directly or indirectly.





## Customer use case

Sundi offers high-performance PCD cutting tools which have been widely used in the automobile, aerospace, and energy industry, to machine aluminum alloy and other non-ferrous metals, the surface roughness can reach  $Ra \leq 0.4$ . One tool can be combined with multiple operations, good choice for cost and machining time reduction.



Before

After

<b>Material of Workpiece</b> AlMgsi12	<b>Application</b> Cylinder head
<b>Device</b> CNC machining	<b>RPM</b> ≥6000/Min



<b>Material of Workpiece</b> AlMgsi12	<b>Application</b> Auto parts
<b>Device</b> CNC machining	<b>RPM</b> ≥6000/Min



## Quality Control

Depending on the quality first, We control the quality from the raw material to the final process.

### 1. Material selection

The tool bit of the diamond reamers uses PCD blanks manufactured by world-famous companies, including E6/GE, The body part uses high-quality tungsten carbide or tool steel, Material reports will be offered if required.



### 2. Tool body inspection

Before welding, the hardness, dimensions, and performance of the tool body will be checked by a tooling micrometer, a hardness testing machine.



### 3. Automatic inspection

With the help of the ZOLLER measuring machine, all simple or complex PCD reamers will be measured by optical projection and analyzed by auto programs which will eliminate human error due to traditional, manual inspection methods.

### 4. Quality tracking and records

All finished PCD reamers will be numbered by our QC before shipment, and we'll offer detailed testing reports for better tracking of every product.

