

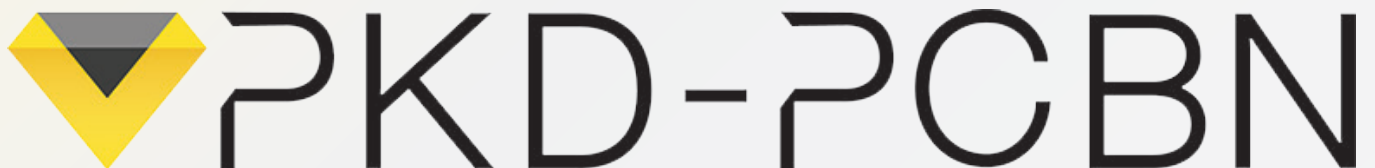


## General Safety Instructions

for handling PCD- and CBN-tipped tools

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PKD-PCBN

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## 1 Information About these Instructions

### 1.1 Read the Operating Instructions

Use and handling of the tool described below do not come naturally and are not self-explanatory. They are therefore explained by the accompanying technical documentation.

The instructions help you to use the tool as intended, properly, effectively and safely. You should therefore read the chapters below attentively and thoroughly. If necessary, keep looking up facts that are essential for your operations.

Gühring KG shall not assume any liability for any damage, broken tools, accidents, etc. and resulting consequential damage occurring in case of non-compliance with the safety instructions and adjustment instructions!

Request new operating instructions if parts of them are lost or damaged. Always keep the operating instructions at an accessible place in the vicinity of the tool.



#### Residual risks

This document informs and warns you of residual risks for which the risk reduction by design and protective measures takes no or no complete effect.

### 1.2 Explanation of the General Icons

Icon	Explanation
	<b>Important information</b> This icon shows important additional information.
	<b>Information about possible damage</b> This icon shows that there is the possibility of material damage.

Tab. 1: General icons

### 1.3 Representation of Warnings

Using the tool always requires actions to be taken that bear a risk. These potentially hazardous actions are preceded by warnings that **MUST** be observed.



#### Important information about the warnings

Take note of all warnings in this documentation. Be particularly careful in these cases. Always communicate the warnings to the other users.


Warnings (including mandatory and prohibitive instructions) are for your personal safety!

#### 1.3.1 Structure of Warnings

The warnings in this document are highlighted with icons and signal words. Icon and signal word show you the severity of the danger.

The warnings that precede each action are shown as follows:



<b>DANGER (1)</b>	
	<b>Type and source of the danger (2)</b> Explanation of type and source of the danger. (3) ➤ Measures to avert the danger. (4)






The warnings are of the following structure:

Position	Information	Contents	Example
1	Danger level	Severity and classification of the danger with signal word and icon	Danger
2	Type and source of the danger	What type of danger exists, and where does it come from?	Danger from electrical current
3	Possible consequences of the danger	What will or can happen when the warning is not observed?	There can be dangerous current flowing through the body when you get into contact with energised parts.
4	Measures to avert or avoid the danger	What can be done? What should not be done? Which protective measures are to be taken?	Have work on electrical systems or equipment only carried out by skilled electricians.

Tab. 2: Structure of Warnings

### 1.3.2 Employed Safety Notes



The following safety notes are used in this document:

 <b>WARNING</b>	
	<b>Warns of a dangerous situation</b> Can cause severe or even fatal injuries when not avoided.
 <b>CAUTION</b>	
	<b>Warns of a potentially dangerous situation</b> Can cause light injuries when not avoided.
<b>NOTE</b>	
	<b>Highlights a potentially harmful situation</b> Not avoiding this situation can cause damage to the system or to something in the system environment.






## 1.4 Explanation of Icons

Warning icons warn of danger spots, risks and obstacles

Warning icon	Explanation
	Warning of a danger spot
	Warning of danger of cuts

Tab. 3: Employed warning icons

Mandatory icons are used for the prevention of accidents at the workplace.

Mandatory icon	Explanation
	General mandatory icon
	Wear protective gloves
	Wear safety shoes

Tab. 4: Employed mandatory icons

## 1.5 Representation of Work Instructions

Work instructions that are to be carried out without a fixed sequence are marked with an arrowhead as a list sign.

Work instructions **MUST** always be complied with.

### Example work instructions

...

- Wear suitable protective gloves.
- Thoroughly clean the tool of any oil residues.

## 2 Manufacturer Specifications

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## 3 Basic Safety Instructions

### 3.1 Duty of Care of the Operating Company



#### **Important information**

The tool has been planned, designed and manufactured taking into consideration directives and standards. It is thus state-of-the-art and ensures a maximum of safety.

During operational practice, however, you can only obtain the safety if you take all the necessary measures. Planning these measures and checking their implementation is within the duty of care of the operating company.

Due to the commercial use of the tool, the operating company is obliged to observe the duties of safety at work. In addition to the safety instructions in these instructions, the application-related safety regulations, the accident-prevention regulation and the environmental regulations must be observed.



#### **Important information**

The operating company must ensure that the General Safety Instructions are read and understood by the personnel.



#### **Important information**

The tool is used inside a stand-alone machine tool. You must thus read and observe all notes and instructions for this machine tool.

#### **Technical condition of the tool**

The following requirements apply for the technical state of the tool and must be ensured by the operating company:

- The tool may only be used as intended.
- Prior to using it, always ensure that the tool is in a faultless technical condition.
- Never perform any unauthorised conversions, manipulation or modifications on the tool.
- The tool must be serviced and checked at the stipulated intervals.
- The General Safety Instructions must always be in a legible condition and a complete version of them must be freely available at the tool's point of use.

### 3.2 General Safety at Work



#### 3.2.1 Personnel qualification



#### **Important information about personnel qualification**

Only instructed, trained and authorised persons are allowed to work on and with the tool.



 <b>WARNING</b>	
	<p><b>Danger from insufficient personnel qualification</b></p> <p>There is a risk of severe injuries and significant material damage if unqualified personnel stay inside the danger area of the tool and machine tool, or carry out work with the tool.</p> <ul style="list-style-type: none"> <li>➤ Only qualified personnel are allowed to work with the tool and on the machine tool.</li> <li>➤ Keep unqualified personnel away from the danger area.</li> </ul>
Designation	Definition
Specialist	<p>Specialist within the meaning of these instructions is a person who successfully completed a professional education in the area of metal cutting. Alternatively, the necessary specialist knowledge can be acquired through several years of professional experience in comparable areas. The specialist must also be experienced in the field of PCD tools, in handling the machine tool that is used, and in the associated processes. The specialist must also be familiar with the applicable relevant standards and regulations. A specialist must be able to assess allocated tasks and to recognize and avoid on his/her own potential dangers due to his/her special training and professional experience.</p>

Tab. 5: Personnel qualification

### 3.2.2 Approved Personnel

Life phase / chapter	Personnel qualification
Transport and Storage	Specialist
Assembly and adjustment	Specialist
Service and maintenance	Specialist
Disposal	Specialist

Tab. 6: Approved Personnel



### 3.2.3 Personal protective equipment (PPE)



#### Important information about the personal protective equipment

The personnel must wear the necessary PPE whenever work is carried out with the tool.

Take note of the list below and of the information about the personal protective equipment installed in the working area.



#### Personal protective equipment (PPE)

The degree of the protective equipment must be assessed and defined for each individual case.

Below is a list of recommended PPE:



#### Wear safety shoes

Safety shoes protect your feet against heavy overturning or dropping parts, and against slipping on a slippery surface.



#### Wear protective gloves

Protective gloves protect your hands against friction, abrasion, punctures or deeper injuries and against a contact with hot surfaces and liquids.

Use only gloves that are approved by the manufacturer of the cooling lubricant used in the machine tool. Please take note of the relevant data sheet.

### 3.3 Machine-Specific Dangers in the Individual Life Phases

#### 3.3.1 Hazards during operation

##### Operation

Refrain from any operation with doubtful safety aspect. Use the tool only as intended. Also heed the following safety instructions at all times.

<b>⚠ WARNING</b>	
	<p><b>Danger due to disregard of the safety instructions for the tool machine.</b></p> <p>Serious injuries can result if safety instructions and the operating instructions for the machine tool are not heeded.</p> <ul style="list-style-type: none"> <li>➤ Heed the safety instructions and operating instructions for the machine tool at all times.</li> </ul>

<b>⚠ CAUTION</b>	
 	<p><b>Risk of injury due to chips</b></p> <p>Sharp-edged chips may be generated when machining the work pieces with the tool. Touching these can lead to cut injuries.</p> <ul style="list-style-type: none"> <li>➤ Wear suitable protective gloves.</li> <li>➤ Thoroughly clean the tool of any chips after machining.</li> </ul>





## ⚠ CAUTION



### Harmful cooling lubricant

The cooling lubricant used in the machine tool can cause allergic reactions and even severe diseases.

- Thoroughly clean the cooling lubricant residues from the device after each utilisation.
- Wear suitable protective gloves.
- Avoid skin contact with cooling lubricant.
- Take note of the data sheet for the cooling lubricant.
- See a doctor if you have any health problems.

## 3.4 Tool-Specific Dangers

### 3.4.1 Hazards caused by sharp cutting edges

Even if it is used as intended and the safety instructions are heeded, the intended use will give rise to residual risks caused by the sharp cutting edges of the tool.

## ⚠ CAUTION



### Danger of cuts due to sharp cutting edges

If handled inappropriately, the sharp cutting edges will lead to cut injuries of the upper limbs.

- Do not touch the cutting edges.
- Pay attention to the sharp cutting edges when handling the tool.
- Wear suitable protective gloves when carrying the tool.

### 3.4.2 Hazards caused by the material of the tool

The cutting edges of the tool are made from polycrystalline diamond or cubic boron nitride to suit the intended use. The following instructions have to be heeded due to the materials' sensitivity.

## NOTE



### Risk of material damage

The great hardness of the cutting edges causes the material to be brittle, making it susceptible damage through contact with other materials.

- Pay attention to the sensitive cutting edges during transport, storage and utilisation of the tool.
- Avoid the cutting edges coming into contact with other materials.
- Visually inspect the tool for damage before every utilisation.
- Do not use any mechanical measuring instruments. Use only optical measuring instruments for tool adjustment and measurement.



## 4 Transport and Storage



### Personnel qualification

The following personnel are authorized for "Transport and storage":

- Specialist with experience with PCD tools



### Important information for your safety

You are responsible!

Always take note and observe the locally valid safety instructions and the safety instructions in chapter "3 Basic Safety Instructions".

## CAUTION



### Danger of cuts due to sharp cutting edges

If handled inappropriately, the sharp cutting edges will lead to cut injuries of the upper limbs.

- Do not touch the cutting edges.
- Pay attention to the sharp cutting edges when handling the tool.
- Wear suitable protective equipment.

## NOTE



### Risk of material damage

The great hardness of the cutting edges causes the material to be brittle, making it susceptible damage through contact with other materials.

- Pay attention to the sensitive cutting edges during transport, storage and utilisation of the tool.
- Avoid the cutting edges coming into contact with other materials.
- Visually inspect the tool for damage before every utilisation.
- Do not use any mechanical measuring instruments. Use only optical measuring instruments for tool adjustment and measurement.



## 4.1 Delivery

### 4.1.1 Scope of delivery

The device comes in a wooden crate that contains all components of the device. The wooden crate is padded to protect the tool from transport damage and can also be used to store the tool.



Check against delivery note and accompanying documents whether all parts of the tool are available, completely and undamaged. Please dispose of the packaging in an environmentally compatible way if you do not want to keep it for future use, such as storage or return shipment.

### 4.1.2 Inspection for transport damage

Inspect the tool for any transport damage immediately on delivery. If any transport damage is detected, please immediately return the tools to us together with a written documentation with photographs. To return the tools, use the Gühring wooden crate that was used for delivery.



## 4.2 Transport

### 4.2.1 Permissible means of transport

The tool comes in a handy wooden crate with handles and practical packaging such that it reaches its point of destination undamaged by normal transport.

We recommend using the wooden crate for any transport of the device. The tool is not heavy and can be carried by a single person.

### 4.2.2 Transport instructions

Please heed the safety instructions in chapter "3 Basic Safety Instructions".

Transport information:

- Always use the wooden crate to transport the tool to its point of use
- Check the completeness of the scope of delivery before each use
- Check the tool for damage before each use

## 4.3 Storage

The following points must be heeded for the tool to be stored safely and without damage:

- The storage space must be clean and dry.
- The tool must be cleaned before storage and an anti-corrosive agent applied. Further information can be found in chapter "6.2 Cleaning"
- Room temperature: 20°C ... 25°C
- The tool must be protected from direct solar radiation and atmospheric influences.



### **Important information about storage**

The device comes in a padded wooden crate. We recommend the use of this crate for storage and transport. This will protect the tool in an ideal manner.



## 5 Assembly and adjustment

### 5.1 Initial Safety Notes



#### Personnel qualification

The following personnel are authorized for "Assembly and adjustment":

- Specialist with experience with PCD tools



#### Important information for your safety

You are responsible!

Always take note and observe the locally valid safety instructions and the safety instructions in chapter "3 Basic Safety Instructions".



#### Important information

The required shape and position tolerances are subject to environmental influences, such as clamping, vibration characteristics at the work piece or at the spindle, coolant pressure, material properties and work piece stability. In ideal environmental conditions, the tools manufactured by Gühring KG are able to meet all quality requirements.

### CAUTION



#### Danger of cuts due to sharp cutting edges

If handled inappropriately, the sharp cutting edges will lead to cut injuries of the upper limbs.

- Do not touch the cutting edges.
- Pay attention to the sharp cutting edges when handling the tool.
- Wear suitable protective equipment.

### NOTE



#### Risk of material damage

The great hardness of the cutting edges causes the material to be brittle, making it susceptible to damage through contact with other materials.

- Pay attention to the sensitive cutting edges during transport, storage and utilisation of the tool.
- Avoid the cutting edges coming into contact with other materials.
- Visually inspect the tool for damage before every utilisation.
- Do not use any mechanical measuring instruments. Use only optical measuring instruments for tool adjustment and measurement.

### 5.2 Preparation of tool

Before the tool can be used, it must be cleaned of any preserving agents, pre-set, checked and balanced.

The steps to be carried out are listed in the following chapters.



## 5.2.1 Cleaning the tool

Before they are stored in the wooden crate, the tools are treated with preserving agents and anti-corrosive agents to protect them from damage during extended storage.

Thus, the tools must be cleaned before they are fitted in the machine tool.

- Clean the tool holder with a suitable cleaning agent before measurement operations or before using the machine.

## 5.2.2 Fine adjustment of the tool

Adjustable tools are pre-set. A fine adjustment is necessary before the tool is used in the machine.



### Important information about the fine adjustment

Adjustable tools are pre-set by Gühring KG. The pre-adjustment and the enclosed measurement reports refer to an ambient and tool temperature of +20 °C. If the tool is perceptibly hotter or colder than room temperature, you must please allow it to cool or heat before measuring.

- Perform a fine adjustment of the tool according to the adjustment instructions provided by Gühring KG. The adjustment instructions can be retrieved by means of the QR code on a label on the wooden crate or by means of the link on the customer drawing.

Please get in touch with your contact at Gühring if you do not have access to the Internet or require an additional hard copy of the adjustment instructions. Gühring KG will send you a hard copy of the adjustment instructions.

## 5.2.3 Checking the tool's concentricity

Before using the tool in the machine tool it must be checked whether the tool's concentricity matches the specification on the customer drawing. If the tool is equipped with an alignment adapter module, the correct procedure can be found in the "Assembly and adjustment instructions for module 6x6 and 4x4 alignment adapter."

- Perform the concentricity measurement for tools at the concentricity control positions provided for that purpose.
- Always perform the concentricity measurement against the tool's direction of rotation.

NOTE	
 	<p><b>Risk of material damage</b></p> <p>The great hardness of the cutting edges causes the material to be brittle, making it susceptible to damage through contact with other materials.</p> <ul style="list-style-type: none"><li>➤ Only use optional measuring instruments.</li><li>➤ Do not use any mechanical measuring instruments. Use only optical measuring instruments for tool adjustment and measurement.</li></ul>



## 5.2.4 Balancing the tool



### Important information

The balancing specifications are specified on the production, customer and quotation drawings. If the customer does not provide any specifications, the Gühring standard  $G=6.3/n=10,000$  rpm is specified. The balancing screws are marked on the customer drawing and are provided with a screw lock. The balancing screws may **not** be adjusted.



### Important information

Tools with indexable insert are not balanced and must be balanced before use.

## 5.2.5 Cut parameters

Always adhere to the cut parameters recommended by us. If the cut parameters are exceeded or under-run without coordinating this with Gühring KG beforehand, we shall not assume any liability in case of possible damage to man, machine and work piece.

## 6 Maintenance

### 6.1 Initial Safety Notes



#### Personnel qualification

The following personnel are authorized for "Service and maintenance":

- Specialist with experience with PCD tools



#### Important information for your safety

You are responsible!

Always take note and observe the locally valid safety instructions and the safety instructions in chapter "3 Basic Safety Instructions".

## CAUTION



#### Danger of cuts due to sharp cutting edges

If handled inappropriately, the sharp cutting edges will lead to cut injuries of the upper limbs.

- Do not touch the cutting edges.
- Pay attention to the sharp cutting edges when handling the tool.
- Wear suitable protective gloves when carrying the tool.



## NOTE



### Risk of material damage

The great hardness of the cutting edges causes the material to be brittle, making it susceptible to damage through contact with other materials.

- Pay attention to the sensitive cutting edges during transport, storage and utilisation of the tool.
- Avoid the cutting edges coming into contact with other materials.
- Visually inspect the tool for damage before every utilisation.
- Do not use any mechanical measuring instruments. Use only optical measuring instruments for tool adjustment and measurement.

## 6.2 Cleaning

For the tool to achieve a long service life, it must be cleaned at regular intervals and an anti-corrosive agent applied.

- Use a specially designed tool cleaning machine or an ultrasonic bath for tool cleaning. A temperature of 80 °C may not be exceeded during cleaning. The cleaning agent used should contain an anti-corrosive agent.
- If the tool will not be used for a longer period of time, it should be lubricated to protect it against corrosion. We recommend AVILUB METACORIN 9755 for this purpose.

## 6.3 Re-tipping / service life

Remove the tool from the machine when the service life recommended by us has expired. On reaching the end of its service life, please return the tool to us for re-tipping. If tools are re-tipped by third parties, our liability for the tool shall cease.

## 7 Disposal

### 7.1 Proper and Environmentally Compatible Disposal



#### Important information

The goal is a proper and environmentally compatible disposal. Re-tipping or disposing of the tool can give rise to waste materials that has to be disposed of. The corresponding authorities issue recommendations for such a disposal.

The recommendations for the disposal of waste material were derived from regulations that were valid at the place and the time of the preparation of these instructions. As the user and the company operating a machine you have the duty of informing yourself about the waste disposal regulations that are valid for your region, and of observing these regulations.

### 7.2 Disposal

Collect the tools to be disposed of and have them fetched by a disposal company. Contact a disposal company in your region for this purpose.

## 8 Guarantee

Gühring KG only guarantees the functions of the cutting tools if the safety instructions, the assembly and adjustment instructions and the recommended cut parameters are observed. Gühring KG shall not assume any liability if there are deviations from the above specifications!