

Safety Precautions when using cutting tools products.

1. When using cutting tool products

In accordance with the Product Liability Law (PL law) enforced on July 1, 1995, our company has attached warning labels and caution labels to the packaging of our applicable products.

However, there are no specific caution notes, etc. displayed on the tools themselves.

Before handling or using any cutting tool or cutting tool material, please read the sections "About safety when using cutting tool products" and "Cautions regarding the use of cutting tools" on our Homepage.

In addition, please teach the information stated in these sections to all workers as part of the safety education at your company.

2. Basic characteristics of cutting tool materials

- **Meanings of words used in this catalog**

Cutting tool materials : General terms such as carbide alloy, cermet, ceramics, sintered CBN, sintered diamond, HSS, alloy steel, etc.

- **Physical characteristics**

- **Appearance**

Varies depending on material properties and material type. Example: Gray, black, gold, etc.

- **Odor**

Odorless

- **Hardness**

Carbide alloy, cermet: 5 to 30GPaHV; Ceramic: 10 to 40GPaHV; Sintered CBN: 20 to 50GPaHV; Sintered diamond: 80 to 120GPaHV; HSS: 2 to 12GPaHV; Alloy steel: 2 to 12GPaHV

- **Specific gravity**

Carbide alloy: 9 to 16; Cermet: 5 to 9; Ceramic: 2 to 7; Sintered CBN: 3 to 5; Sintered diamond: 3 to 5; HSS: 7 to 9; Alloy steel: 7 to 9

- **Composition**

Including carbides, nitrides, and sulfides of W, Ti, Al, Si, Ta, Nb, B, V, etc. as well as metal components of Fe, Co, Ni, Cr, Mo, etc.

3. Cautions regarding the handling of cutting tool materials

- Cautions regarding the handling of cutting tool materials.
- Since carbide tool materials have high specific gravities, be careful to handle large products or large quantities as heavy materials.
- The thermal expansion of carbide tool materials is different from that of metal materials. Because of this, for shrink-fit or cooling-fit products, if the usage temperature is slightly higher (lower) than the specified temperature, cracking may occur.
- If cutting tool materials become corroded due to cutting fluid, lubricating agents, or other moisture, their strength will be reduced. Care should be taken regarding storage conditions.

4. Cautions regarding machining of cutting tool products (materials)

- For carbide tool materials, the strength may be slightly reduced due to the surface conditions. For finishing, always use a diamond grinder.
- When cutting tool materials are ground or heated, dust or mist (smoke) occurs. If a lot of it is inhaled, swallowed, or comes in contact with the eyes or skin, it could result in injury to the body. When machining, be careful to avoid exposing your body to the dust or mist; it is recommended that localized ventilation equipment be used and that a protective mask, protective goggles, and protective gloves be worn. In addition, if the dust, etc. comes in contact with your hands, wash them thoroughly with soap and water. Do not drink or eat in the work area, and wash your hands before drinking or eating. Dust on clothes should not be shaken out; use a vacuum, etc. to remove the dust or wash the clothes in a washing machine. If the cobalt contained in the cutting tool material is touched repeatedly or over a long period of time, it has been reported that it may affect the skin, respiratory organs, or heart, etc.
- For detailed information, refer to the MSDS published by our company.
- MSDS = Material Safety Data Sheet (safety data sheet for chemical substances, etc.)

- When performing wet machining of carbide tool materials or brazed tool, the cutting fluid may contain heavy metals and must be disposed of properly.
- When a cutting tool product has been reground, check that there are no cracks after regrinding.
- If a laser or electric pen, etc. is used to mark carbide tool material or products, cracks may form. Do not mark sections which may be subject to stress.

Precaution for using cutting tools

Item	Caution	Counterplan
General Cutting Tools	Direct touch to the sharp cutting edge may cause injury.	<ul style="list-style-type: none"> ● When placing them in the machine or taking them out of the case, please wear protective gloves.
	Misuse or mismatch of working conditions may cause tool breakage or dispersion of broken pieces.	<ul style="list-style-type: none"> ● Please use safety items, such as safety glasses and protective gloves. ● Please use them according to our recommended cutting condition. (See our catalog for instruction.)
	Excess impact or heavy wear will increase cutting resistance and may cause tool breakage and dispersion of broken pieces.	<ul style="list-style-type: none"> ● Please use safety items, such as safety glasses and protective gloves. ● Please inspect tool regularly and don't run them to complete failure.
	Dispersion of heated or prolonged chips may cause injury or burn.	<ul style="list-style-type: none"> ● Please use safety items, such as safety glasses and protective gloves. ● Use appropriate devices to remove chips. Never use your hands.
	During cutting operation, cutting tools get very hot. Touching the tools immediately after operation may cause burn.	<ul style="list-style-type: none"> ● Please use safety items, such as safety glasses and protective gloves.
	Sparks, generation of heat or chips in high temperature during operation may cause fire.	<ul style="list-style-type: none"> ● Please don't operate in an area where there is a potential of fire or explosion. ● When oil-coolant is used, please be sure to have a fire prevention system installed.

	Lack of dynamic balance in high-speed revolution can cause vibration and broken tool.	<ul style="list-style-type: none"> • Please use safety items, such as safety glasses and protective gloves. • Please operate test-run before cutting, and confirm that there is no vibration or unusual sound.
	Direct contact to the rough surface on the work may cause injury.	<ul style="list-style-type: none"> • Please don't touch work materials with bare hand.
Indexable Cutting Tools	Loose inserts or parts may cause injury.	<ul style="list-style-type: none"> • Please clean the insert pocket and fixture before operation. • Please tighten the inserts with supplied wrench only, and confirm that the inserts and parts are clamped completely.
	When clamped too tight by supplementary tools like pipe etc, inserts or body may be broken.	<ul style="list-style-type: none"> • Please tighten them with supplied wrench only.
	When indexable tools are used in high-speed revolution, they may burst out of the body due to centrifugal force.	<ul style="list-style-type: none"> • Please use them according to our recommended cutting condition. (See our catalog for instruction.)
Milling Cutters and Other Milling Tools	Since milling cutters have sharp edges, direct contact with bare hands may cause injury.	<ul style="list-style-type: none"> • Please use safety items, such as safety glasses and protective gloves.
	If cutter lacks dynamic balance, tool breakage or dispersion of broken pieces may occur by vibration.	<ul style="list-style-type: none"> • Please use them according to our recommended cutting condition. (See our catalog for instruction.) • Rotating portion and dynamic balancing should be periodically checked to prevent from eccentric rotation or run out due to wear of bearing portion.
Brazed Tools	When drilling through hole with turning work, a kind of disk(reminder parts sometimes flies out from the end of the table.	<ul style="list-style-type: none"> • Please use safety items, such as safety glasses, protective gloves and covers on the machine.
	Some micro drills have sharp edges and point. Direct touching may cause injury.	<ul style="list-style-type: none"> • Use gloves to change tools.
Brazed Tools	Broken inserts by tool breakage may cause injury.	<ul style="list-style-type: none"> • Please confirm if they are firmly brazed.

		<ul style="list-style-type: none"> • Please don't use brazed tools in the condition that requires high cutting temperature.
Others	When brazing is carried out again and again, the strength of carbide insert is deteriorated and becomes easy to be broken during cutting.	<ul style="list-style-type: none"> • Carbide tools which are brazed several times should not be used because its strength has deteriorated.
	It is dangerous to use tools except for the fixed application. It may cause damage of tool and machine.	<ul style="list-style-type: none"> • Please use them according to our recommended cutting condition. (See our catalog for instruction.)