



The right knives for the right application

Cemented carbide knives for Li-Ion battery industry



Message from Chief Material Engineer

Pursuing the latest technology, quality and reliability for more than 22 years

Since the establishment of our company in 1998, we have continued to develop various industrial cutting tools mainly using cemented carbide for all our products, based on our core technology of precision machining.

The current core cutlery business is a business that has grown by concentrating management resources and meeting customer demands for quality, precision, and performance.

In recent years, we have developed cermet as a new material, and have been producing cutting tools, knives for various metal processing, and knives for lithium-ion battery electrodes.

The Company's products and services have been steadily expanding their fields of application, both in Japan and overseas.

The environment surrounding the Company and the speed of change in technological innovation are rapid, and the Company will continue to develop its market research capabilities and we are required to have the ability to research the market ahead of the times and to develop technologies to meet the needs of our customers ahead of other companies.

In addition to our existing product lines, we will contribute to a wide range of industrial fields that are expected to grow in the future, such as the electric vehicle industry, consumer electronics, metal processing industry, and recycling industry, with products that feature new material development and high-precision processing.

In addition, as a member of society, we will strive to be the "best partner" for our customers around the world by constantly improving technology, quality, productivity, and delivery.

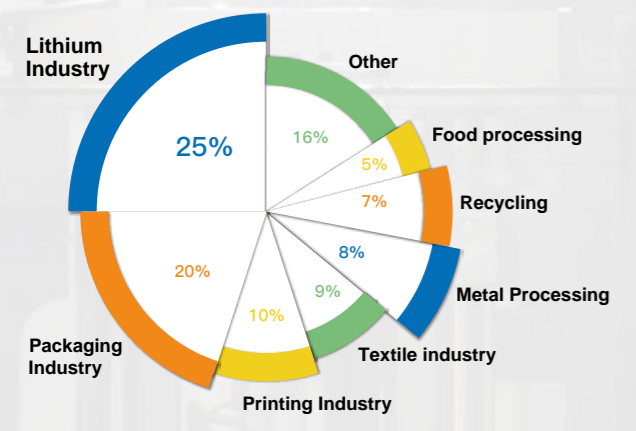
As a manufacturing company, we believe that "stable manufacturing of high quality products" is the most earth-friendly business activity (no wasteful consumption of resources and energy, no wasteful discharge of wastes).

In addition, we are working to build a production quality management system that aims for a "zero defect rate" and the elimination of environmentally hazardous substances in the manufacturing process.

We are determined to fulfill our social responsibility as a company. We look forward to your continued patronage and support.

Chief Material Engineer
Masanori Nishikawa

Product structure composition



Note: The data is based on the statistics of the past five years (As of Dec. 25, 2020)



ABOUT US

ACCUROMM Central Europe Sp Zoo is a Japanese special cutting tool manufacturing company. Our manufacturing network is all over the world, such as in Japan, Korea, China, Thailand, Indonesia, Australia, USA, Mexico or Poland. Beside our own manufacturing plants, we are also working with external suppliers to develop and manufacture special industrial carbide tools.

Our partner company was founded in 1998. The company has a registered capital of 11 million EUR, covers an area of more than 50 acres and employs more than 300 people. The company has the whole production line from the preparation of cemented carbide powder to the precision machining of cemented carbide tools.

From the very beginning, the company has set "providing reliable and durable carbide industrial tools for various industries" as its mission. After more than 20 years of development and cultivation, the manufactured cemented carbide industrial tools have been maturely applied in new energy, packaging, printing, metal processing, textile and other industries, continuously contributing to the improvement of product quality and production efficiency for our customers.

Lithium-ion battery, as one of the new energy industries that the world has been focusing on in recent years, is also an industry that we have been working hard on. Around the lithium-ion battery industry slitting (cross-cutting), diaphragm slitting, non-ferrous metal slitting represents the highest demands of industrial slitting field. Technology in the lithium-ion battery industry continues to innovate and our customer needs are also more and more sophisticated and diversified. In order to meet these needs, our company continues to invest in various precision equipment, improve the company's quality system management level, and manufacture products that satisfy our customers, making our company a trusted partner for our customers.

Production site at a glance

<p>① Powder granulation of raw materials</p>	<p>② Precision press molding</p>	<p>③ Sintering to alloy</p>	<p>④ Alloy Material Testing</p>
<p>⑤ Grinding process</p>	<p>⑥ Coating process</p>	<p>⑦ Finished product size inspection</p>	<p>⑧ On-site testing</p>

Carbide grades suitable for tools in the lithium-ion battery industry

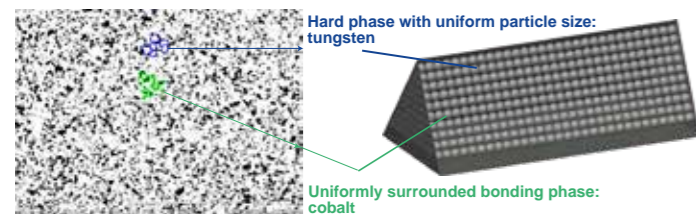
Cemented Carbide: It is a composite material, usually made of a relatively soft binder material (e.g. cobalt, nickel, iron or a mixture of these) plus a hard material (e.g. tungsten carbide, tantalum carbide, chromium carbide, titanium carbide or a mixture of these, etc.). The choice of the right grade is the basis for the quality of the slitting.

A. Tungsten Cobalt Cemented Carbide Grade GS26D

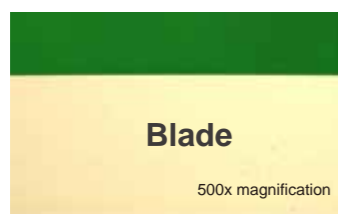
High strength, chipping resistant!

Grade	Density (g/cm ³)	Vickers hardness (kgf/mm ²)	Fracture toughness (MPa·m ^{3/2})	Flexural strength (MPa)
GS26D	14.1	1480	19	4800

GS26D is a sub-fine grain tungsten-cobalt (YG) carbide grade developed by our company for industrial slitting tools. Thanks to our leading inert partial pressure and controlled cold sintering technology, GS26D has a more uniform bonding phase distribution than similar grades in the industry, which significantly improves the chipping resistance and corrosion resistance of the material. In lithium-ion battery slitting (Shear cut), the upper and lower knives not only have good wear resistance, but also have excellent chipping resistance and are not easily chipped.



GS26D BEI (backscattered electron phase) photo x.3000



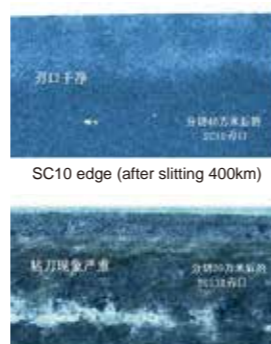
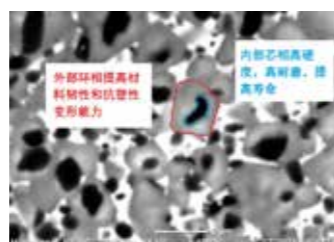
GS26D edge

B. Titanium carbide based cermet grade SC10

3-L Advantage!

Grade	Density (g/cm ³)	Vickers hardness (kgf/mm ²)	Fracture toughness (MPa·m ^{3/2})	Flexural strength (MPa)
SC10	6.4	1600	10	2200

SC10 is a fine-grained titanium nitride (TiCN)-based cermet material developed by Mr. Masanori Nishikawa, our Chief Material Engineer, and is the first to be used in the field of lithium-ion battery slitting, turning a new page for precision industrial slitting manufacturing materials. Compared with the tungsten-cobalt (YG) cemented carbide materials commonly used in the field of lithium-ion battery slitting, our cermet uses the more environmentally friendly and lower density titanium carbide (TiCN) powder as the main raw material. By using Japan's leading low-pressure inert atmosphere sintering technology, the material reacts with solid solution to obtain a compound hard phase with strong self-sharpening, making a lighter, longer life-span, and less metal sticking cutting knife.



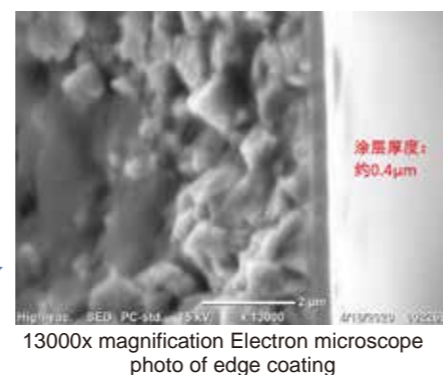
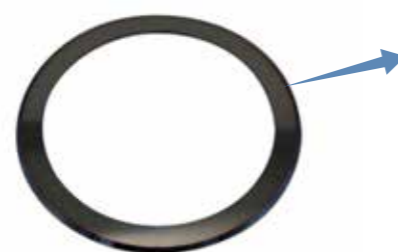
Other maker's carbide cutting edge (after slitting 200km)

C. Diamond-like coating grade TC26D

High abrasion resistance and anti-adhesion!

Our Diamond-Like Coating (DLC) grade TC26D adopts a unique ultra-thin, hydrogen-free technology, which is like giving a sharp edge a solid (ultra-hard) and smooth (low friction coefficient) coating. It is like a strong (ultra-hard) and smooth (low friction coefficient) armor on the sharp edge. The sp² (graphite structure) and sp³ (diamond structure) bonds are precisely proportionally controlled, giving TC26D a long life and continuous resistance to edge adhesion in the slitting of lithium-ion battery cells.

Long life Anti-adhesion



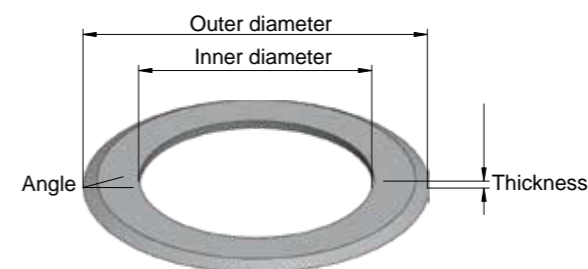
SLITTER KNIVES FOR LI-ION BATTERY ELECTRODE

Electrode slitting knife

In the process of slitting positive and negative lithium-ion battery pieces, collapsed edges and burrs caused by poor quality of slitting knife edges can cause battery short circuit problems and form serious safety hazards. We have more than 20 years of experience in manufacturing cemented carbide industrial cutting tools, and all the alloy blanks are produced by ourselves, and we have a deep understanding of the grinding and processing of alloy cutting tools. Adhering to the "craftsman" spirit, we strictly control the dimensional tolerance of the inserts. The unique edge precision machining technology and 100% edge automation equipment full inspection process ensure the excellent performance of our lithium-ion battery slitter knives.



R & D - Rapid Automatic Edge Inspection Machine



No	Specification (unit: mm)*			Available materials			Remarks
	OD	ID	Thickness	GS26D	SC10	TC26D	
1	100	65	0.7	✓	✓	✓	Upper knife
2	100	65	2.0	✓	✓	✓	Lower knife
3	110	90	1.0	✓	✓	✓	Upper knife
4	110	90	3.0	✓	✓	✓	Lower knife
5	130	88	1.0	✓	✓	✓	Upper knife
6	130	70	3.0	✓	✓	✓	Lower knife
7	130	97	1.0	✓	✓	✓	Upper knife
8	130	95	4.0	✓	✓	✓	Lower knife
9	98	66	0.7	✓	✓	✓	Upper knife
10	80	55	10.0	✓	✓	✓	Lower knife

*The above are common specifications and can be customized according to customer needs.

STRAIGHT CUTTING KNIVES FOR LI-ION BATTERY ELECTRODE



Electrode cross-cutting knife

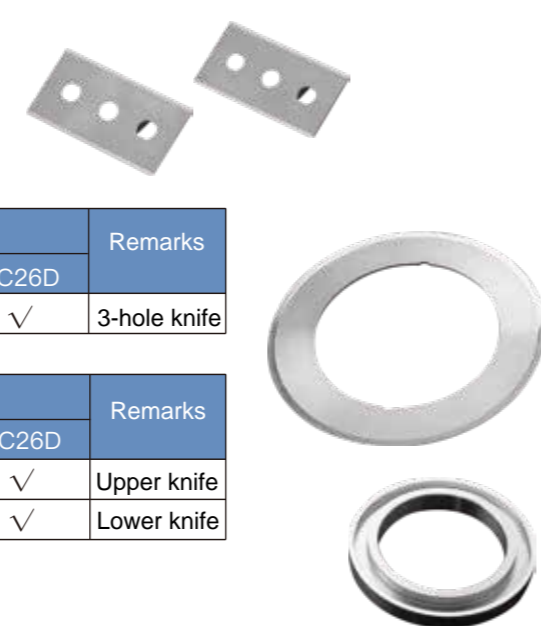
Used in the subsequent cross-cutting process after the slitting of positive and negative lithium-ion battery sheets.

No	Specification (unit: mm)*			Available materials			Remarks
	Length	Width	Thickness	GS26D	SC10	TC26D	
1	103	18	7	✓			Moving knife
2	103	42	4	✓			Fixed knife
3	51	34	3	✓			Moving knife
4	29.7	22	20	✓			Fixed knife
5	396	75	22.5	✓			Fixed knife
6	365	41	15	✓			Moving knife

KNIVES FOR SEPARATOR FILM

Separator slitting knife

Our unique technology of fine treatment on the surface of the cutting edge inhibits the occurrence of burrs and dust on the cutting surface.



No	Specification (unit: mm)*			Available materials			Remarks
	Length	Width	Thickness	GS26D	SC10	TC26D	
1	43	22	0.2/0.3/0.4	✓		✓	3-hole knife

No	Specification (unit: mm)*			Available materials			Remarks
	OD	ID	Thickness	GS26D	SC10	TC26D	
1	98	66	0.7	✓		✓	Upper knife
2	80	55	10	✓		✓	Lower knife

SLITTER KNIVES FOR CAPACITOR

Capacitor slitting knife

Used to slit rolls of aluminum foil electrodes inside capacitors.



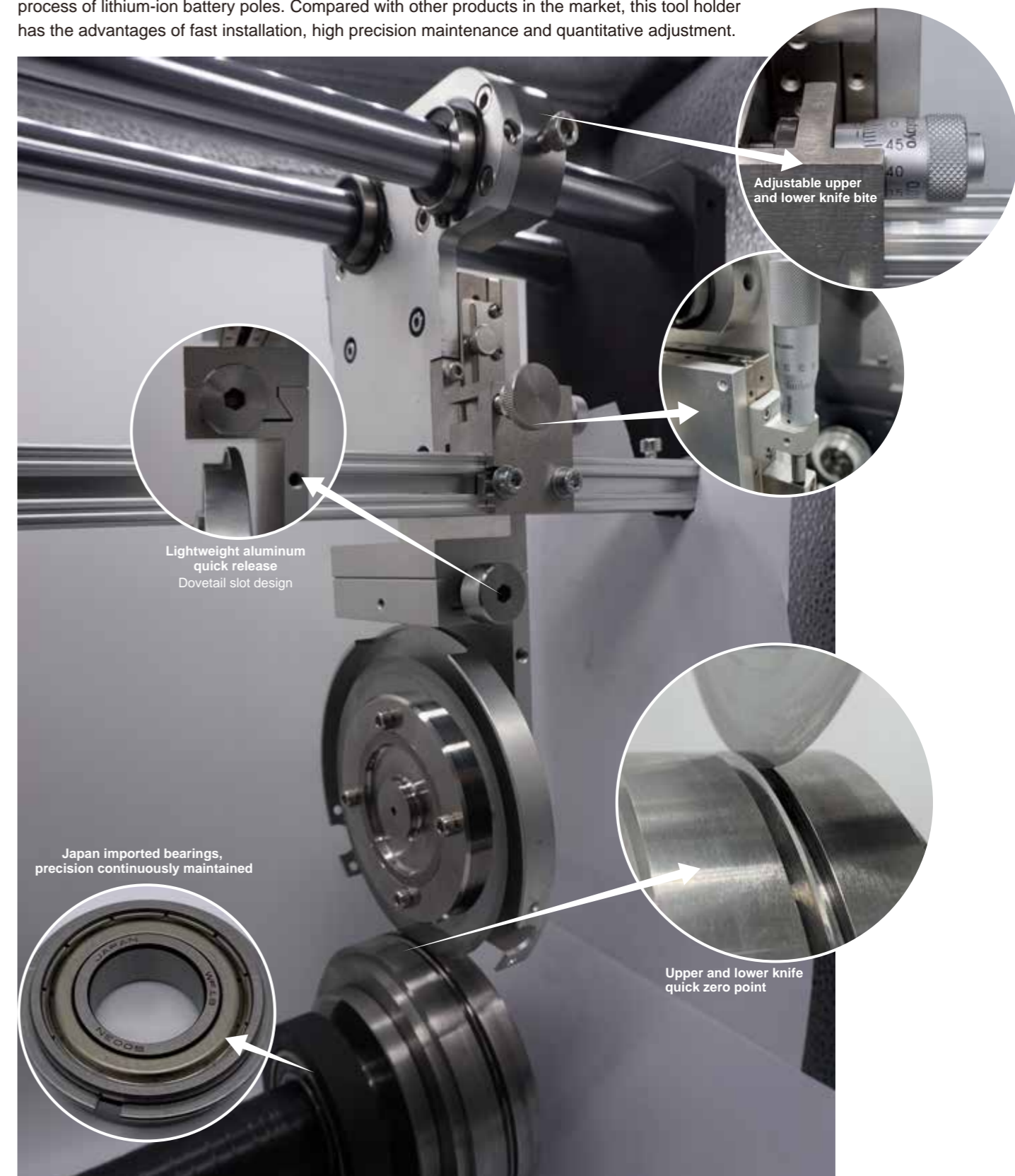
No	Specification (unit: mm)*			Available materials			Remarks
	OD	ID	Thickness	GS26D	SC10	TC26D	
1	68	46	0.5	✓	✓	✓	Upper knife
2	60	40	5.0	✓	✓	✓	Lower knife

*The above are common specifications and can be customized according to customer needs.

PRECISION KNIFE HOLDER FOR LI-ION BATTERY ELECTRODE SLITTING APPLICATION

Lithium-ion battery electrode slitting knife holder

We have developed a high-precision quick-assembly slitting upper tool holder for the current problems in the slitting process of lithium-ion battery poles. Compared with other products in the market, this tool holder has the advantages of fast installation, high precision maintenance and quantitative adjustment.



Adjustable upper and lower knife bite

Lightweight aluminum quick release
Dovetail slot design

Japan imported bearings,
precision continuously maintained

Upper and lower knife quick zero point