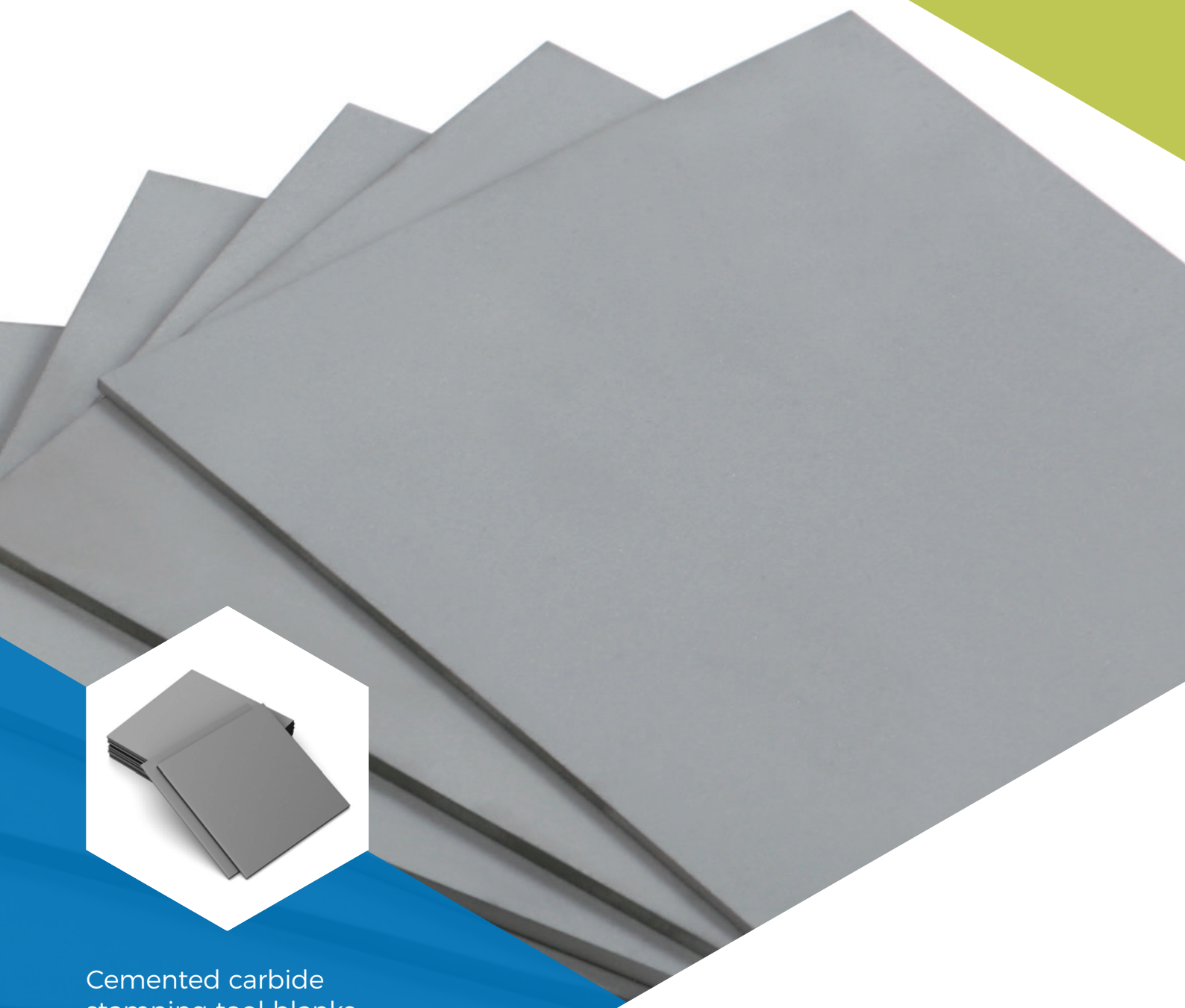
ENGINEERED SOLUTIONS

Stamping Tool Blanks



Cemented carbide
stamping tool blanks

HYPERION
Materials & Technologies

WELCOME TO HYPERION MATERIALS & TECHNOLOGIES

Hyperion Materials & Technologies is an engineering company with more than six decades of experience in the development and manufacturing of innovative diamonds, cubic boron nitrides, and cemented carbides. In addition to innovative materials, Hyperion offers our extensive knowledge, unique services, and application development capabilities to support our customers' competitive needs.

We are over 1,600 people dedicated to creating solutions for your hard and super-hard material needs through partnership, innovation, and invention. Hyperion's offering includes a wide range of cemented carbides for wear parts applications from automotive to medical to food and beverage.

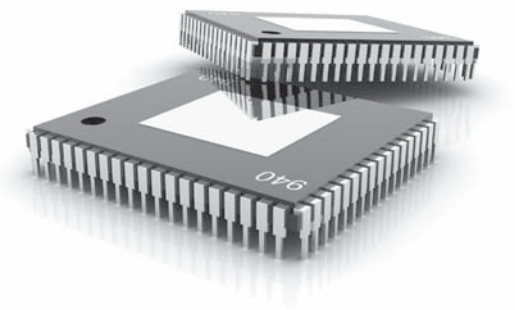
Hyperion's technical expertise and global manufacturing facilities are a foundation from which a network of local sales and customer service teams support our customers in the development of effective solutions.

STAMPING TECHNOLOGY

Stamping technologies are continuously moving to higher speeds, higher precision, and higher automation with the goals of increased production efficiency, cost savings, and human safety and consistent quality. When the stamping speed reaches hundreds or even thousands per minute, the quality of the stamping tool becomes even more critical. On top of the variety of products and processing materials, increased production volumes also push the tool design to challenge the stamping tool material requirements.

Hyperion has been developing and supplying solutions for more than six decades. Our extensive knowledge of cemented carbide and related cermets allows us to tailor solutions for a wide variety of applications. Conventionally the cemented carbide grades for stamping processes fall into the metal forming area, but for high speed processes, the requirements move toward the metal cutting area where Hyperion is particularly strong and has an outstanding reputation. We would like to open the doors to new solutions with you.

Hyperion Materials & Technologies stamping blanks are manufactured by industry leading sintering equipment manufactured in Germany. All products are sintered with HIP (Hot Isostatic Pressure) to ensure free porosity and stress relief, which help to ensure the best performance of the material during all processes.



HYPERION CEMENTED CARBIDES

Hyperion Materials & Technologies offers a wide range of cemented carbide grades to solve all your stamping tool needs.

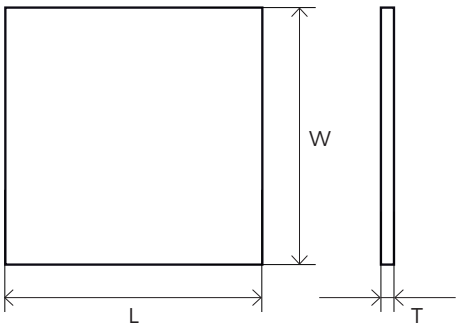
CEMENTED CARBIDE PROPERTIES

GRADE	GRAIN SIZE	HARDNESS		FRACTURE TOUGHNESS K_{1C} ($MN/m^{3/2}$)	TRS (N/mm^2)	CORROSION RESISTANT
		HRA	HV30			
12UF	Ultra fine	92.5	1700	10	3500	
H15F	Submicron	90.4	1380	17	3900	
H10F	Submicron	92.1	1600	13	3750	
12EF	Submicron	91.7	1570	13	3750	✔
H12F	Submicron	91.2	1490	15	3800	
H6N	Medium	92.1	1600	12	2200	
H12N	Medium	89.5	1300	16	2800	
H6P	Medium coarse	90.7	1430	14	2300	

Hyperion offers a wide range of stamping blank standard sizes. Contact your Hyperion product specialist to develop a stamping blank specific to your needs.

BLANKS WITH GRINDING ALLOWANCE

BLANK SIZE			THICKNESS TOLERANCES (mm)
WIDTH (mm) [a, b]	LENGTH (mm) [a, b]	THICKNESS (mm)	
105	105	1 - 9	+0.4 / +0.8
105	105	10 - 21	+0.6 / +1.2
105	105	22 - 39	+0.8 / +1.6
105	105	40 - 50	+1.0 / +2.0
105	105	51 - 60	+1.2 / +2.4
60	150	≤ 70	< 2% of size
75	100		
75	150		
75	200		
100	150		



(a) For sizes with width and length equal to 105 mm, actual size can vary from 103.8 to 106.8 mm depending on grade selection. Tolerances on width and length are +1.5 / 0 mm.

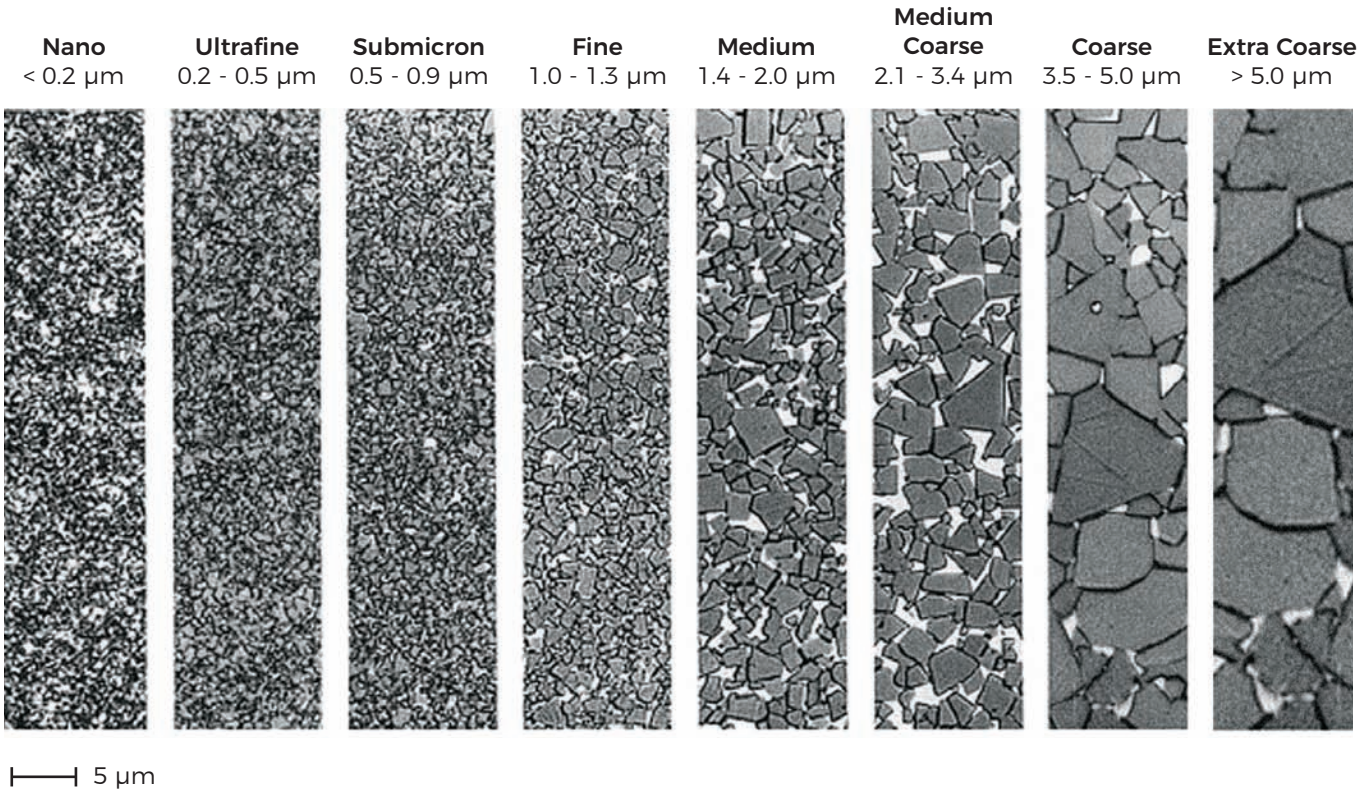
(b) For sizes with width and length not equal to 105 mm, tolerances on width and length are < 2% of size.

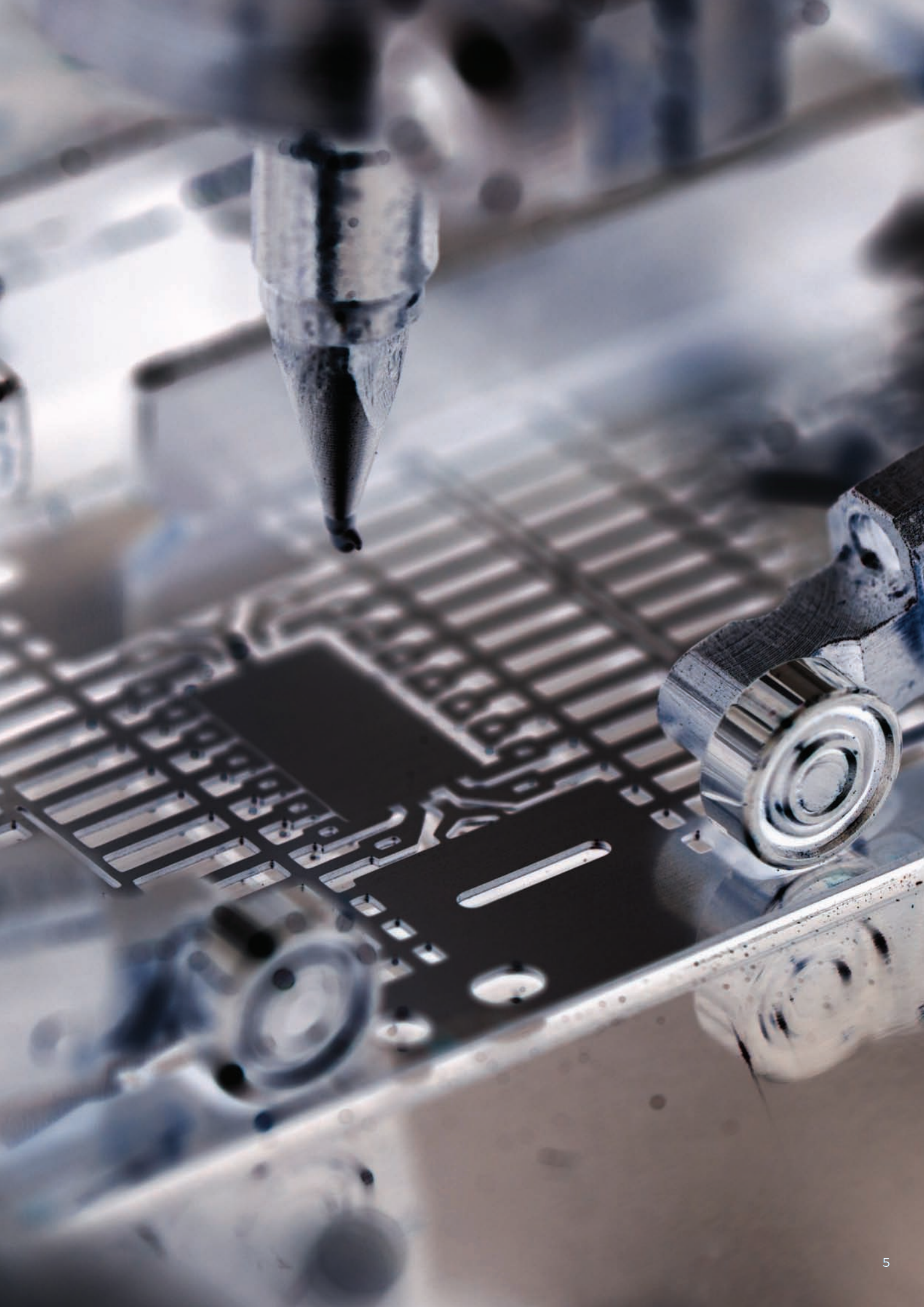
HYPERION CEMENTED CARBIDES

From atomic engineering of crystal grain boundaries to the customer-specific design of a wear part, Hyperion Materials & Technologies is dedicated to advancing the frontiers of cemented carbide technology in order to meet our customers' present and future needs. Every stage in the manufacturing of a cemented carbide component – from powder production to finishing – is crucial to ensuring optimum performance.

At Hyperion, we take pride in having full control of each processing step and in developing proprietary production processes that further improve our technological capabilities. Our mission is to develop new products and new cemented carbide grades that enhance our customers' operations through superior performance and reduced costs.

Hyperion manufactures a wide range of cemented carbide grain sizes, as presented below.





HYPERION CEMENTED CARBIDES GRADES AND APPLICATIONS

Below is an overview of the most common Hyperion Materials & Technologies cemented carbide grades suitable for typical stamping applications. For any other application, the Hyperion engineering team has the ability to evaluate the specific parameters of the stamping process and to recommend the tungsten carbide grade.

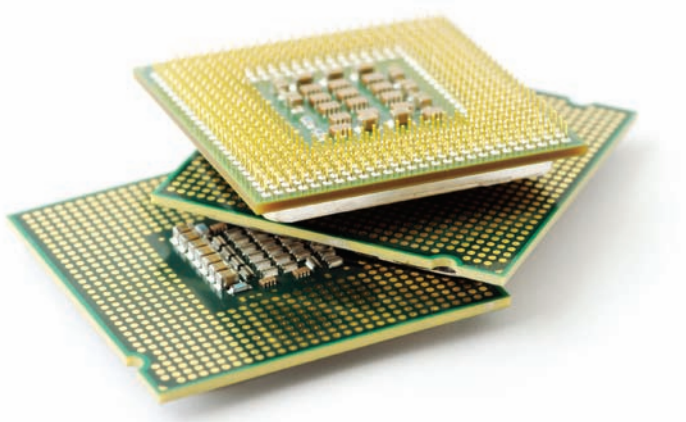
GRADE	GRAIN SIZE	APPLICATIONS
12UF	Ultra fine	- IC lead frame - Semiconductor - LED support - Electronic connector
H15F	Submicron	- Electronic connector - Motor
H10F	Submicron	- Electronic connector - Motor
12EF	Submicron	- Electronic connector - Acoustics product
H12F	Submicron	- Electronic connector - Motor
H6N	Medium	- LED support - IC lead frame - Electronic connector
H12N	Medium	- Electronic connector - Acoustics product
H6P	Medium coarse	- LED support - Electronic connector - Relay

Ultrafine Grades

Hyperion Materials & Technologies has been manufacturing cemented carbide blanks for toolmakers in the integrated circuit (IC) industry since the 1980s when we introduced the ultrafine grades. These unique cemented carbides are best fit for stamping tool applications such as IC lead frames.

Today's trend towards miniaturizations and higher strokes per minute further increases the demand on the stamping tool material.

Hyperion's grade 12UF provides exceptional performance for sharp edge profiles through a combination of high wear resistance and high toughness.

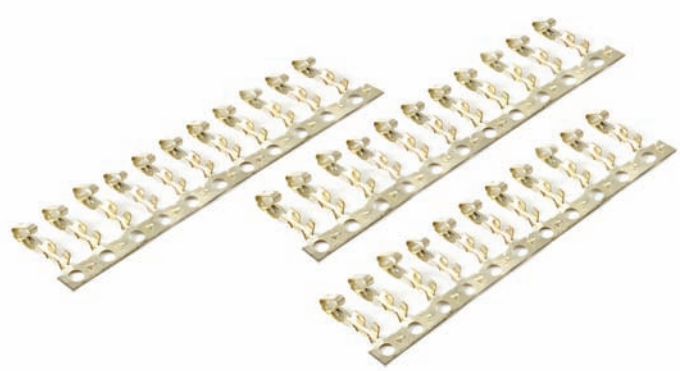


Submicron Grades

When working with high pressure, the ability of the cemented carbide to withstand deformation is key to guaranteeing reliability of the stamping process. Additional challenges on the tool material include attaining sharp cutting edges after grinding and no chipping during use.

Hyperion Materials & Technologies' submicron grades H15F, H10F, and H12F offer high hardness (HV30 from 1380 to 1600) in combination with high fracture toughness (K_{1C} from 13 to 17). In addition, these grades exhibit high stiffness and good thermal conductivity that is critical for tool life performance.

Hyperion grades exhibit lifetimes double those of competitor's grades in electronic connector production.



Grade 12EF - New Generation of Submicron Grades

Processing stainless steel has been a challenge for different industries due to its tendency of work hardening and material adhesion during the stamping process.

Our grade 12EF is blended in a unique way to overcome this challenge as Hyperion Materials & Technologies has optimized not only the tungsten carbide grain distribution but also improved the strength of the binder phase in order to provide the best edge strength and also the ability to resist corrosion and oxidization.

Grade 12EF has shown performance superior to that of competitor grades in many of our key customers.

In addition, grade 12EF is also designed for electrical discharge machining (EDM) processing to prevent damage from galvanic corrosion.

Medium and Medium Coarse Grades

Hyperion Materials & Technologies also provides solutions for processing soft materials such as pure copper and pure iron. Our grades H6N and H6P help to eliminate the tendency of adhesion to working material.

The high toughness of these two grades makes them the perfect solution for some applications with thick materials.

RESEARCH & DEVELOPMENT

Hyperion Materials & Technologies has a foundation of pioneering research and development. We partner with our customers to create innovative technologies and materials solutions. Contact your Hyperion sales person to discuss the process for finding solutions to your wear parts needs:

- Develop tailored solutions to fit your needs
- Respond to market changes and trends
- Use of dedicated state-of-the-art laboratories
- Use of modeling center to simulate both the behavior of materials and components.

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