2025

WELCOME TO ISCAR'S WORLD

Member IMC Group

www.iscar.com

Contents

ISCAR IS ABOUT TO CHANGE METAL CUTTING... AGAIN!

ISCAR is set to revolutionize metal cutting once again with its latest product launch, "**LOGIQUICK**". This new brand name signifies ISCAR's new marketing theme and encompasses three key words: "Logic", "**IQ**", and "Quick". The previous campaigns by ISCAR have already highlighted the importance of intelligent cutting tools for advanced machining, providing logical solutions that meet the primary of modern production. These tools have become a market standard in numerous workshops worldwide. However, the addition of "QUICK" in the logo brings forth a sense of anticipation. What new challenges will the campaign products present? Is it simply a catchy brand name or a fundamental concept? Let's explore the meaning of the logo and its implications.

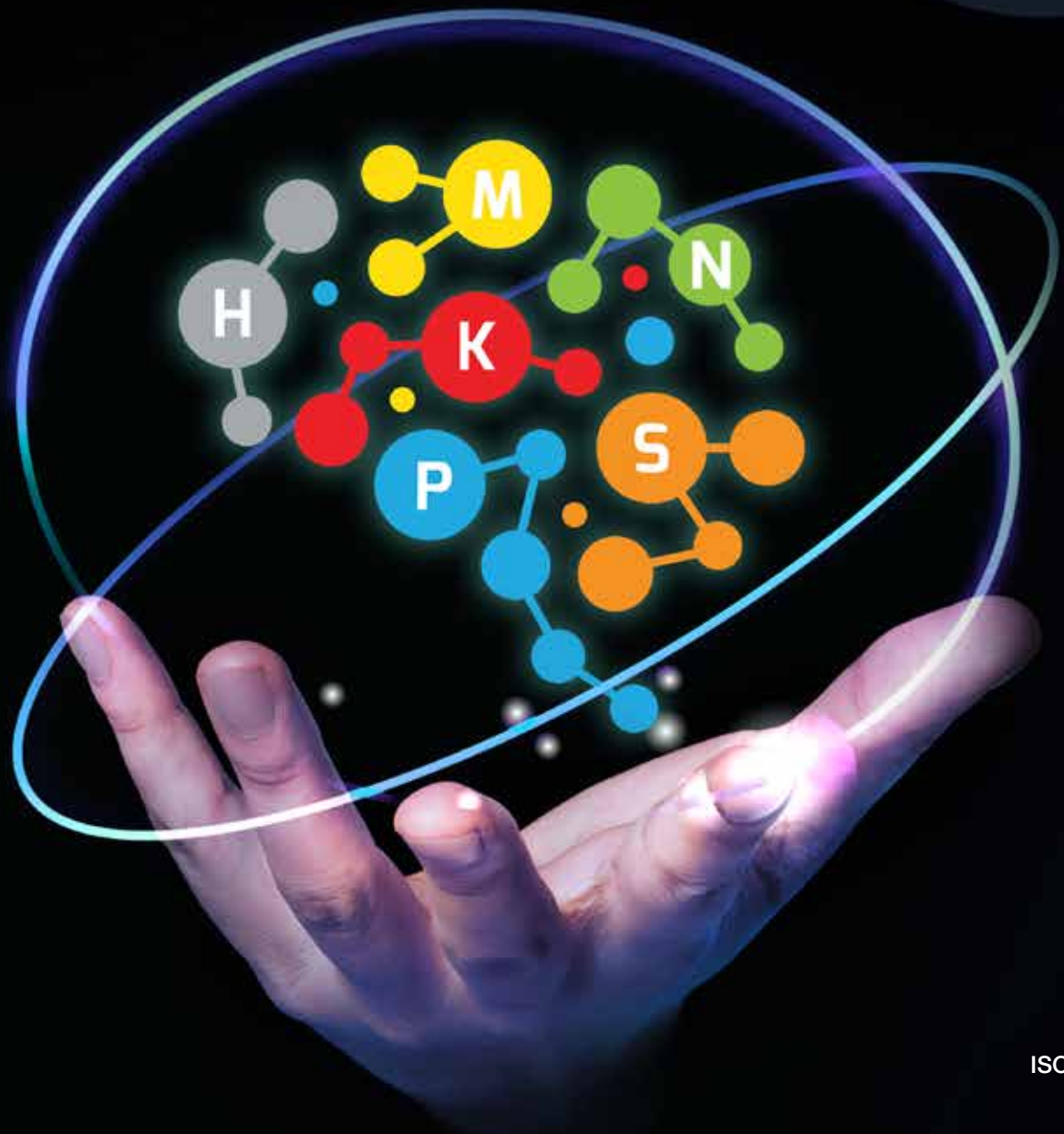
LOGIQUICK
MACHINING INTELLIGENTLY

YOU

MACHINING

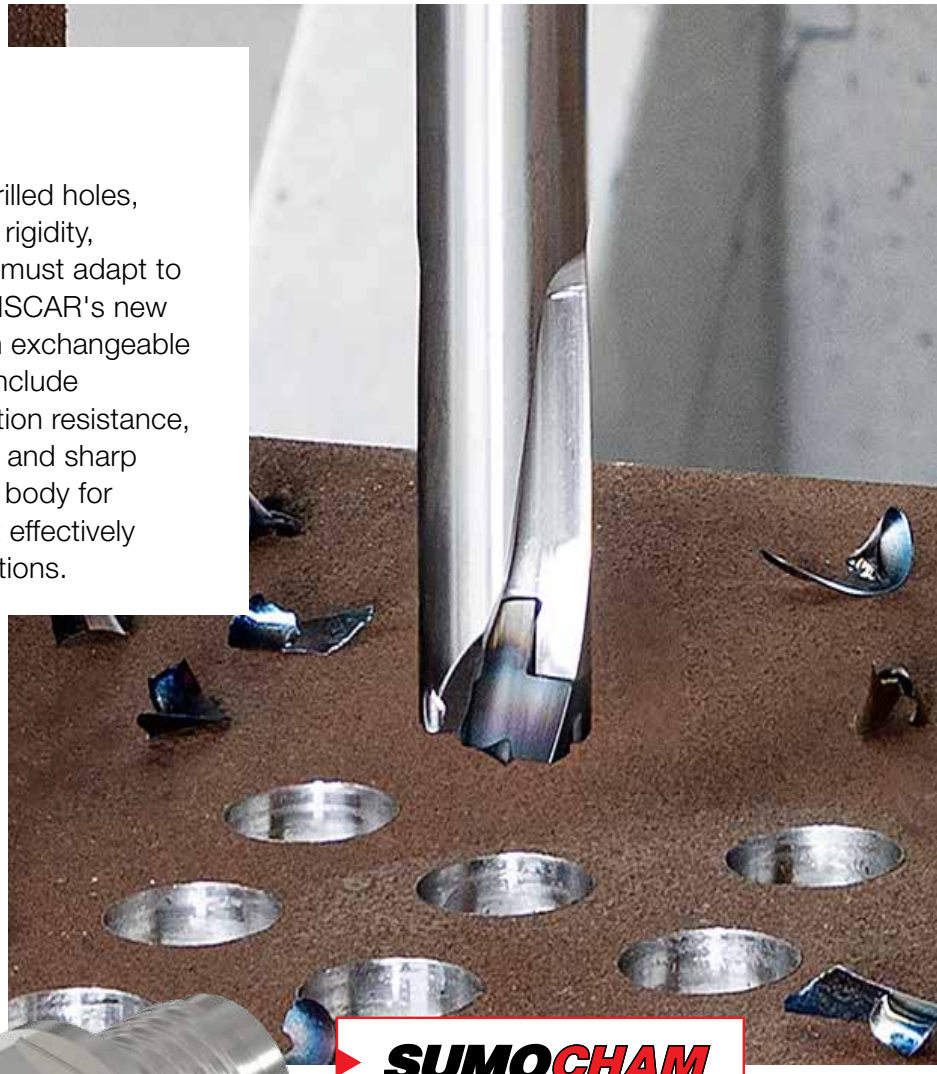
INTELLIGENTLY?

In metal cutting, productivity is tied to metal removal rates (MRR). The industry aims for 'fast metal removal' using efficient cutting methods, machines, strategies, and tools to reduce cutting time. However, the cutting tool often becomes the weakest link, limiting productivity gains, cost reduction, and profitability growth.
ISCAR aims to supply cutting tools that ensure efficient metal removal with qualities like repeatability, versatility, user-friendliness, and high utilization. These attributes represent the tool's IQ, essential for leveraging advanced machine-tool capabilities. This principle guides ISCAR's development of innovative tool solutions for intelligent machining. The latest **LOGIQUICK** campaign introduces groundbreaking cutting tools for turning, parting, grooving, hole making, and milling. Let's explore the **LOGIQUICK** portfolio and its exciting new developments.



Rotating Tools

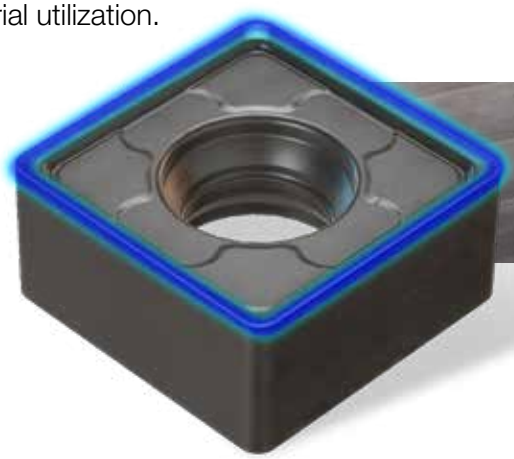
Steel construction beams require numerous drilled holes, but machine clamping mechanisms often lack rigidity, challenging drilling tools. Efficient drilling tools must adapt to non-rigid conditions for optimal performance. ISCAR's new **SUMO-CHAM** solution addresses this with an exchangeable tungsten carbide drilling head. Key elements include PVD-coated IC954 carbide grade for deformation resistance, an IHP-BP head with a centering cutting edge and sharp corners to prevent burrs, and a reinforced drill body for enhanced rigidity. This **SUMO-CHAM** product effectively drills thin beam sections under unstable conditions.



SUMOCHAM

Introducing a new innovative product, the modular **SUMO-CHAM** drill head with **MULTI-MASTER** adaptation, combining strengths from two leading ISCAR lines. This drill head accommodates any **SUMO-CHAM** exchangeable heads and fits **MULTI-MASTER** shanks, allowing easy customization in shape, length, and diameter. This reduces tool inventory and minimizes the need for special drills, creating a promising synergy with tremendous potential.

Efficient material removal via milling is vital for producing critical parts like titanium aircraft components. Extended flute indexable cutters, or 'milling porcupines,' excel in this task, especially for cavities, pockets, and edges. The new **QUICK-X-FLUTE** family features 90-degree extended flute shell mills with double-sided square inserts. These mills balance rigidity and chip flow, enabling high metal removal rates with substantial radial engagement. The flute profile enhances vibration resistance, boosting cutting data and productivity. Inner channels with replaceable nozzles provide high-pressure coolant to the cutting zone, improving cooling, lubrication, and chip control. The double-sided square insert offers 8 cutting edges, maximizing material utilization.



QUICK X FLUTE

Non-Rotating Tools

Success in machining high temperature superalloys (HTSA) hinges on the right cutting tool material. Introducing IC1017, a new tungsten carbide grade for ISO-standard inserts in turning HTSA, featuring a high-hardness submicron structure and PVD coating for higher cutting speeds. **LOGIQ-6-TURN**, a newly designed triangular insert, offers a cost-effective solution for semi-finish and finish turning, focusing on high surface quality. This double-sided insert with a 55° corner angle and positive rake geometry provides 6 cutting edges, a significant alternative to the standard DCMT inserts with only 2 edges. **LOGIQ-6-TURN** inserts easily mount on tools designed for TNMG inserts.

LOGIQ6TURN FINISH

Maximizing profitability through efficient material use in parting is crucial. ISCAR's **DO-GRIP** family has expanded with three new double-sided inserts for narrow parting, ideal for Swiss-Type lathes. These tools optimize material savings for small-diameter bars and thin-walled workpieces. Part of the **LOGIQUICK** campaign, these releases highlight the rising demand for quick metal removal and advanced cutting tools, driving intelligent tool development.

DO-GRIP

LOGIQUICK

MACHINING INTELLIGENTLY

LOGIQUICK DRILLING

LOGIQUICK GROOVING

LOGIQUICK TURNING

LOGIQUICK MILLING

BE QUIQK IN TURNING OPERATIONS

Many consider the lathe the precursor to modern machine tools, marking the start of machining. Today, turning remains a widely used process, with lathes being a significant part of the global machine tool inventory. Consequently, turning tools form a substantial portion of leading cutting tool manufacturers' product ranges. ISCAR's latest campaign, **LOGIQUICK**, introduces innovative developments in turning tools. Some products expand existing ISCAR lines, while others offer unique solutions for advanced manufacturing, reflecting modern metal cutting trends and enhancing the profitability of turning operations.

There is a great satisfaction in building good tools for other people to use.

Freeman Dyson

Several key features characterize the development directions in turning tools, including the following

Higher Efficiency and Precision

This involves turning tools that can enhance productivity and precision, accelerate the overall machining process, and minimize waste.

Advanced Cutting Materials and Progressive Coating Methods

Cutting-edge materials such as ceramics and cubic boron nitride (CBN) are becoming more common in turning tools. Due to excellent heat resistance and durability, these extra-hard materials offer superior cutting speed when compared to traditional tungsten carbide. Concurrently, the need for rapid metal removal is driving interest in progressive coating technologies for cemented carbides. Innovative coatings can enhance cutting capabilities, extend tool life, and reduce wear.

Multi-Directional Turning Tools

These high-quality, versatile tools not only increase productivity and machining efficiency by reducing the number of tool changes but also minimize tool inventory, decrease machine downtime, and maintain tighter tolerances.

Digitalization

The Industry 4.0 approach underscores the importance of a turning tool's digital component as an integral part of smart manufacturing.

Sustainability

Given the pressing nature of environmental issues, there is a growing demand for cutting tools, including turning tools, which have a smaller environmental impact. This means they should be less energy-intensive and generate less waste.

With the above in mind, we should examine the new products in ISCAR's turning tool line that are part of the **LOGIQUICK** campaign. Indeed, turning encompasses many external and internal machining applications, including longitudinal turning, facing, profiling, chamfering, grooving, parting, and boring. Let's study ISCAR's most recent turning advancements and highlight their features.

Advanced Cutting Material to Boost Turning Efficiency

ISCAR has expanded its range of ceramic grades for ISO-standard turning inserts. The new additions are designed for efficient machining of hard steel and cast iron (ISO H group). The IC1017 carbide grade targets nickel-based superalloys, featuring a high-hardness submicron substrate and a PVD coating for higher-speed turning. For non-ferrous materials like aluminum and brass (ISO N group), ISCAR has introduced new turning and grooving inserts with a nanocomposite diamond-like coating (DLC).

QUICK T LOCK

Multi-Directional Benefits

QUICK-T-LOCK is an innovative tool family for multi-directional cutting, including front and back turning, profiling, and facing with one tool. It features a unique insert-clamping concept for stability at high feed rates and an advanced chipformer for high-feed turning, especially in backworking. V-shape **CUT-V-GRIP** inserts enable bidirectional external turning and can fit modified holders, accessing narrow areas where standard V-type ISO inserts cannot be used.

CUT V GRIP

Not Boring News in the Boring Line

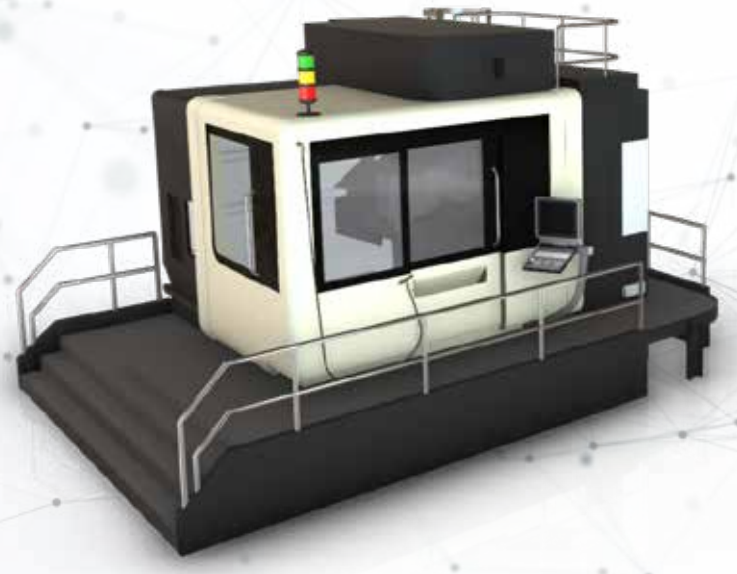
High overhang boring often causes vibrations, affecting surface finish, tool life, power consumption, and performance. Adjusting cutting conditions can reduce vibrations but may prolong machining time.
A new anti-vibration holder with an active damping mechanism provides an alternative, enhancing productivity in rough to finish boring operations.

PICCOINDEX
INDEXABLE INSERTS

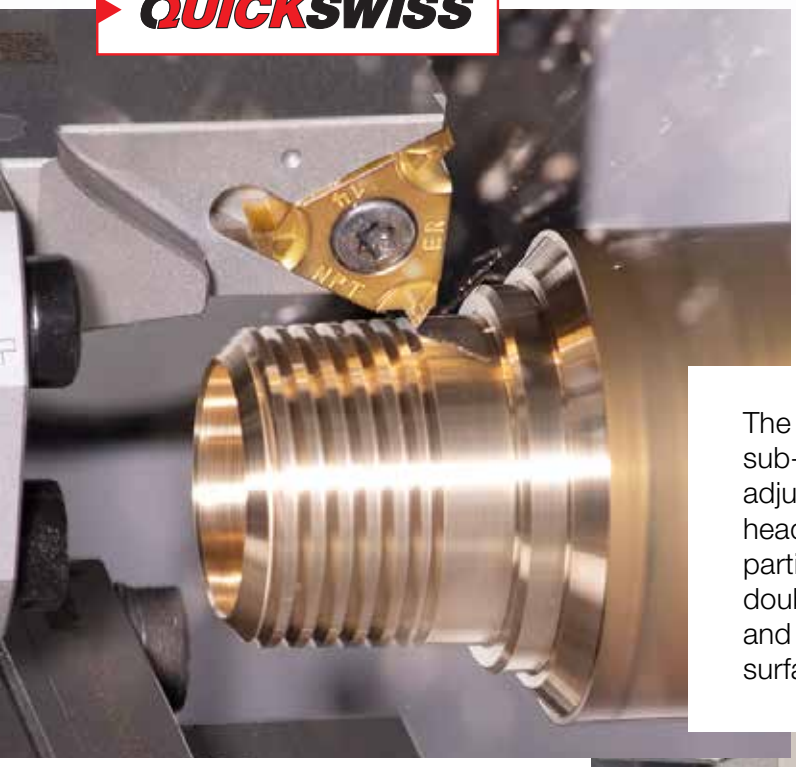
ISCAR's **PICCO** tool system is designed for machining small parts, suitable for turning, boring, threading, and drilling operations. Popular in workshops for miniature components, a typical **PICCO** tool includes a holder and a solid carbide cutting insert. The system now includes **PICCO-INDEX**, featuring steel and carbide boring bars for existing toolholders, engineered for small ISO-standard indexable inserts. This offers a cost-effective solution for rough and semi-finish operations in compact part production.

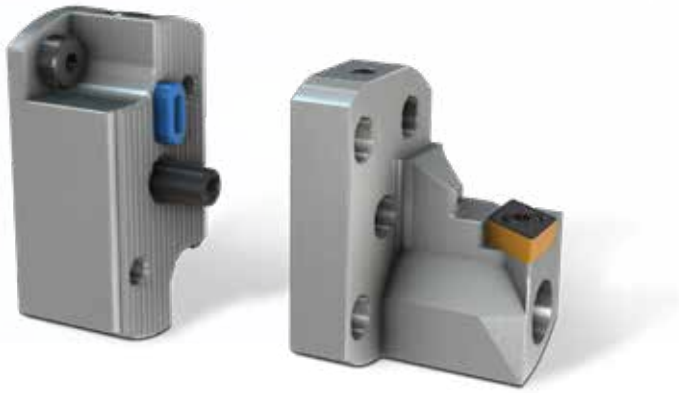
Swiss-Type in Focus

CNC Swiss-type lathes are vital in modern manufacturing for their precision and ability to perform multiple operations simultaneously. They are key in producing miniature components for industries like watchmaking, medical devices, automation, and electronics. Developing advanced tools and toolholders for Swiss-Type lathes is a priority for manufacturers, including ISCAR, highlighted in their **LOGIQUICK** campaign.



QUICKSWISS

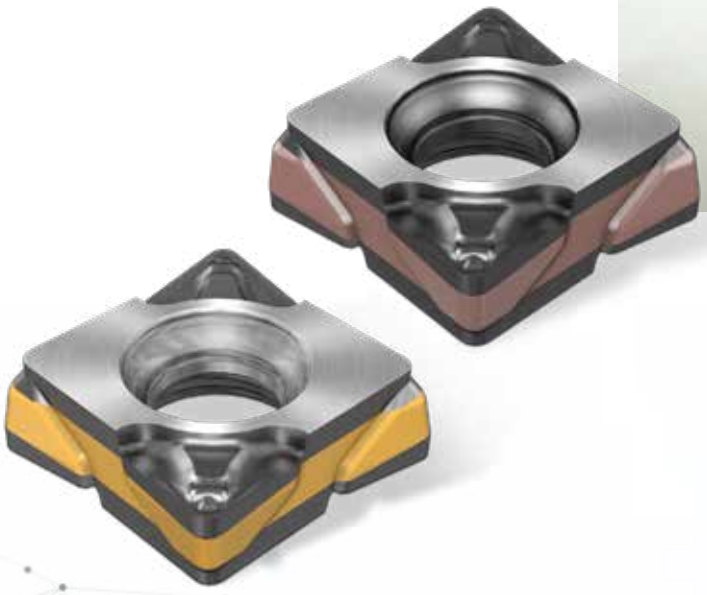




The **QUICK-SWISS** modular system addresses most sub-spindle applications on Swiss-Type lathes with height adjustment options and a variety of bases, holders, and heads. The **QUICK-2-CUT** family is ideal for grooving, parting, and recessing, featuring high-precision, narrow, double-sided inserts mounted tangentially for high rigidity and repeatability. Targeted coolant improves tool life and surface finish.

QUICK2CUT MINI

The **LOGIQ-4-TURN** family of turning tools with indexable double-sided inserts has been well-received in the market. In response to this positive feedback, the company has expanded the family range to include smaller-sized inserts, providing a cost-effective solution for Swiss-Type and compact lathes.
In ISCAR's electronic catalog, two new filter search options specifically related to Swiss-Type lathes have been added. These options allow for the search of modular adaptations to find more efficient tools for main and back tool posts.



LOGIQ4TURN
POSITIVE DOUBLE SIDED

The **LOGIQUICK** campaign's turning package encompasses far more than the products currently under consideration. The company is gradually introducing new product families in quick succession and plans to allocate more time to analyzing these new arrivals. Will they boost productivity and contribute to a rapid increase in customer profitability? ISCAR firmly believes the answer is a resounding "yes", with an added message to the manufacturer: " Be quick to follow up on new advantages in turning operations!"

Did You Know...

Q Are fast feed cutters recommended for milling operations in turning or multi-task machines?

A Yes. In general, these are small to medium diameter cutters and the turning operation is fast. The use of fast feed cutters results in improving the milling operation, reducing the machining time and minimizing damages to the machine head. **MULTI-MASTER** is an excellent option for turn-milling machines.

Q What are the recommended grades to use on ISO-M / ISO-P materials?

A The first choice for many applications is IC808. If you need a harder grade with more wear resistance use IC807. If you need a tougher grade with more impact resistance (Interrupted cuts) use IC830.

Q How to improve part straightness and surface?

A Use neutral insert and a stable tool with the minimum overhang needed. Adjust the cutting parameters.

Q What is the correct deep drilling cycle with the pre-hole and the next tool?

A In order to avoid mistakes, it is best to prepare the pre-hole with the same geometry that you intend to use for the subsequent deep drilling operation. For a more detailed explanation.

Q What is the effect of high-pressure coolant?

A **JET-CUT** tools have the ability to supply coolant directly into the cutting zone, ensuring high coolant efficiency, improved chip control, reduced heat and longer insert life. The high pressure coolant effect is applied to the machining of sticky and gummy materials such as super alloys, stainless steel, titanium etc.

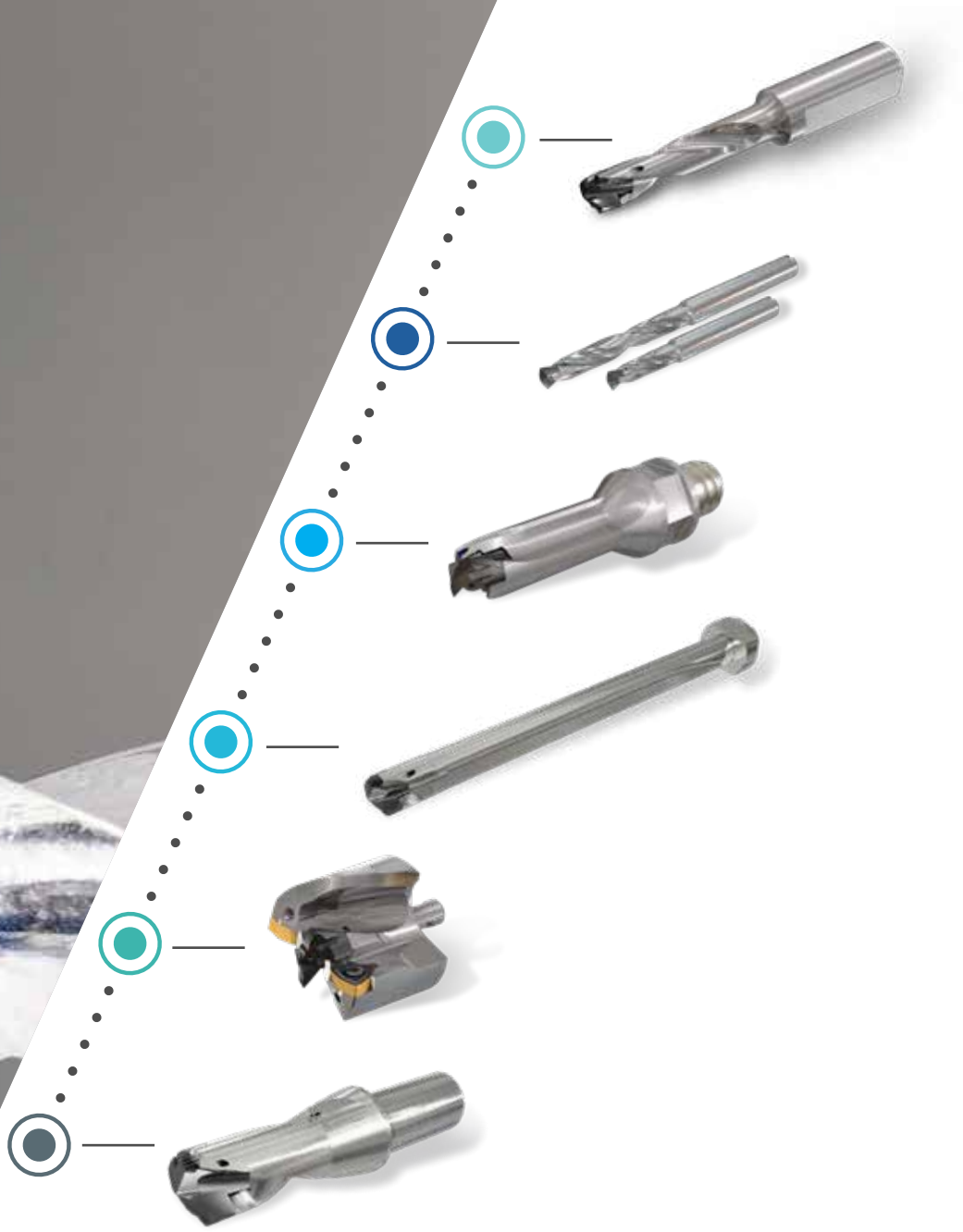
Q How we can shorten process time?

A Use with multi tooth threading inserts (2M, 3M)
Using two or three teeth combinations allow fewer passes and shorter cutting times. These are available for the most common profiles and pitches and are a good choice for economic threading in mass production.

BACK TO DRILLING

SUMO-CHAM, ISCAR's line of drills with exchangeable carbide cutting heads, is highly innovative and successful. Launched at the turn of the century, **SUMO-CHAM** is known for high-speed drilling, offering productivity, reliability, and versatility. It simplifies the drilling process by allowing only the head to be replaced quickly, without regrinding or additional setup, reducing machine downtime significantly.

NO SETUP TIME



Over the years, ISCAR has continued to expand and upgrade the **SUMO-CHAM** line and its derivatives, introducing new features and innovations to further improve performance and productivity. Therefore, it is understandable that the **LOGIQUICK** campaign could not overlook the continued development of such effective and popular drilling tools. Predictably, the new designs that enhanced the company's holemaking portfolio were of interest to manufacturers involved in metal cutting. ISCAR's assembled drills with exchangeable three-flute heads have already received enough space for discussion. Hence, we can limit ourselves to mentioning that this concept has enabled ISCAR to create a family of counterboring tools, which seems promising. Combining the **SUMO-CHAM** with a **MULTI-MASTER** connection substantially expands the product range providing new options for finding optimal tool configurations.

The **SUMO-L-DRILL** line, part of ISCAR's development, features drills with exchangeable carbide heads for challenging conditions like slanted surfaces and cross holes. Each drill has a robust head securing mechanism with **SUMO-CHAM**'s self-clamping principle and a side lock screw. Made from high-grade steel, the drill body has specially shaped flutes for strength and dual nozzles for continuous coolant flow. The head's geometry enhances performance under tough conditions, and the straight, polished flute allows smooth chip evacuation on lathes.

SUMOLDRILL

MODUDRILL

MODU-DRILL, a modular hole-making tool family, now includes replaceable heads for large diameters (30-40 mm) with two cutting edges: a central **SUMO-CHAM** head and two peripheral trigon-shaped inserts. These heads enable stable, productive drilling up to an 8:1 depth-to-diameter ratio without pre-drilling.

The **PICCO** line, known for high accuracy in micro-machining, has evolved to meet growing demands for small-sized tools. Typically, **PICCO** tools feature a steel holder and a carbide cutting part, popular for turning, parting, grooving, and threading on Swiss-Type machines and small CNC lathes. The **LOGIQUICK** campaign introduces new **PICCO** additions for holemaking, including a solid carbide drill with a shank for **PICCO** connections. This drill has internal channels for coolant, improving cooling, lubrication, and chip removal, and its slim design enhances accessibility in hard-to-reach areas.

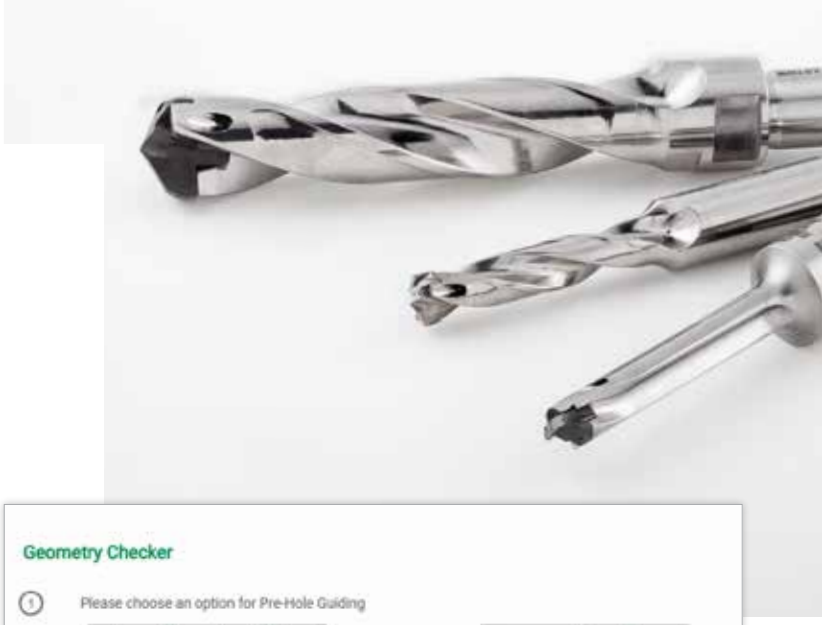
A new development combines **SUMO-CHAM** and **PICCO** into one solution, featuring a durable body with a **PICCO** connection and an exchangeable **SUMO-CHAM** drilling head. It offers internal coolant supply, excellent dimensional repeatability, and high versatility with various heads. Another enhancement introduces a **PICCO** insert with three cutting edges for better performance in internal turning and chamfering, also utilizing internal coolant channels for improved chip control and longer tool life.

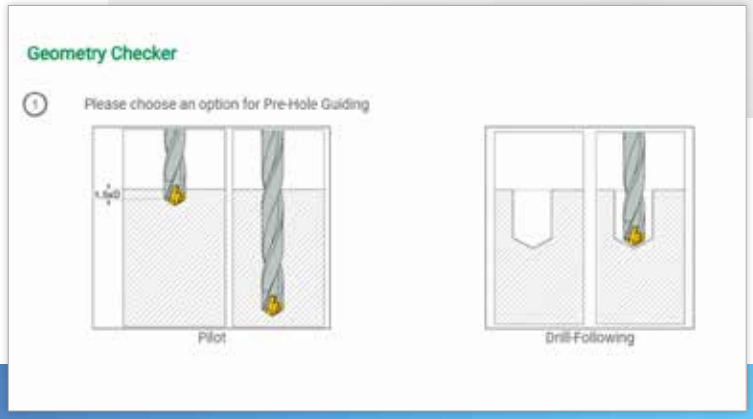
PICCOSUMOCHAM

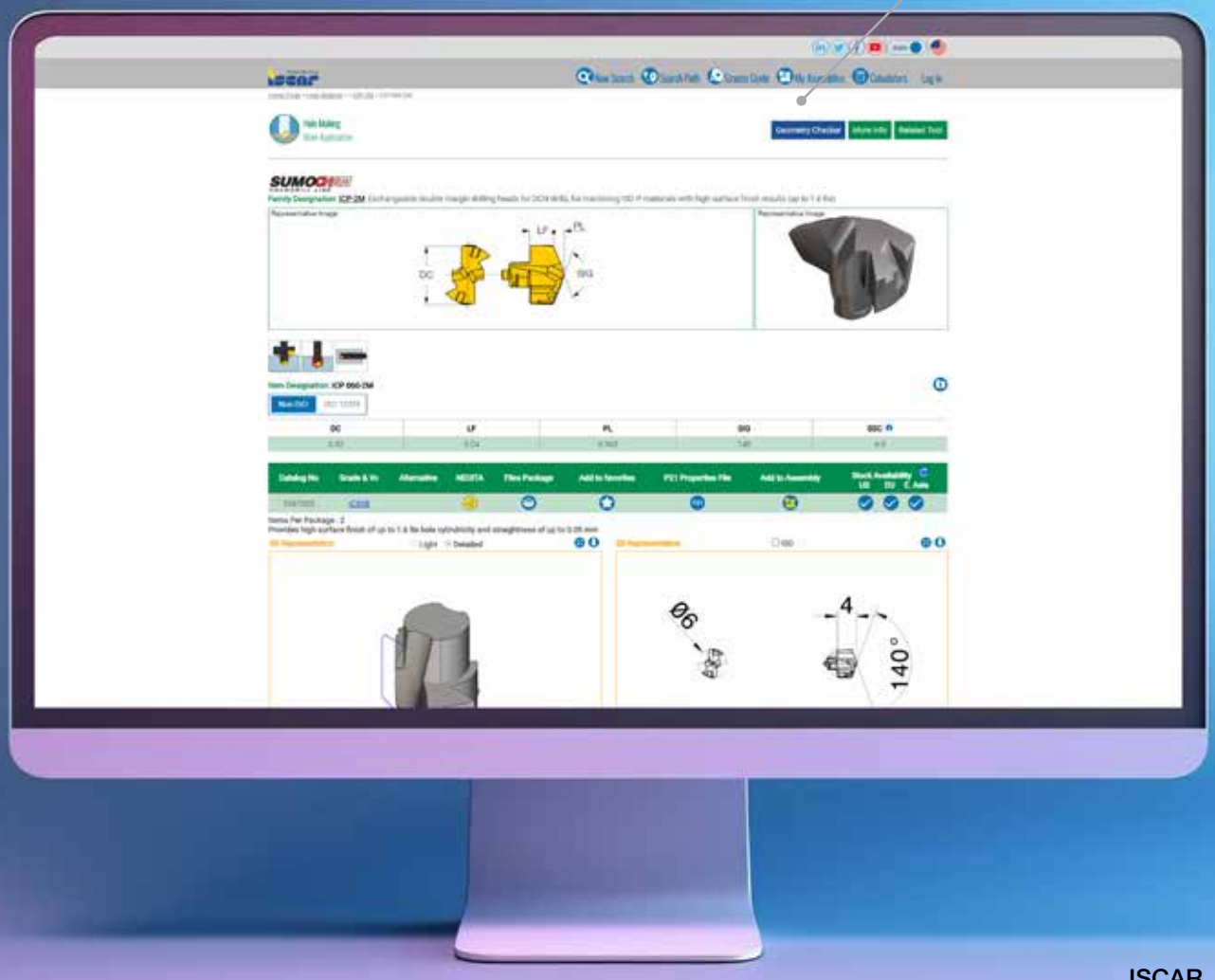
The **MULTI-MASTER** concept, featuring exchangeable solid carbide heads secured with a threaded connection, excels in shallow-depth drilling. The **QUICK-3-CHAM** drill's three-flute design and the **MULTI-MASTER**'s robustness offer a productive solution for materials that generate short chips. New **LOGIQUICK** developments include slim hydraulic chucks for high speeds and runout repeatability, double-chamfer guide pads for deep-hole drilling to enhance entry and surface finish, and extra-long solid carbide drills for cast iron machining.

MULTI-MASTER

The digital component of a drilling tool has expanded its offerings with a new function for E-Catalog users: the **Geometry Checker**, which allows for quick and easy selection of the correct drilling heads for various operations.
Summarizing the above, it is evident that the new **LOGIQUICK** development in holemaking not only continues the advancement of the company's successful lines. It reaffirms ISCAR's distinctive hallmarks: a commitment to enhancing customer profitability through the creation of highly versatile tools that utilize high-performance cutting.







HELICAL MOTION

The introduction of the ISCAR **HELI-MILL** in the 1990s marked a significant milestone in milling tools. It revolutionized the design of milling tools with indexable inserts, establishing a new approach that would shape the industry for years to come. This breakthrough was achieved using a parallelogram-shaped carbide insert, featuring a helical cutting edge formed by the intersection of the insert's helical side and shaped top surfaces. The **HELI-MILL** concept offers several advantages.

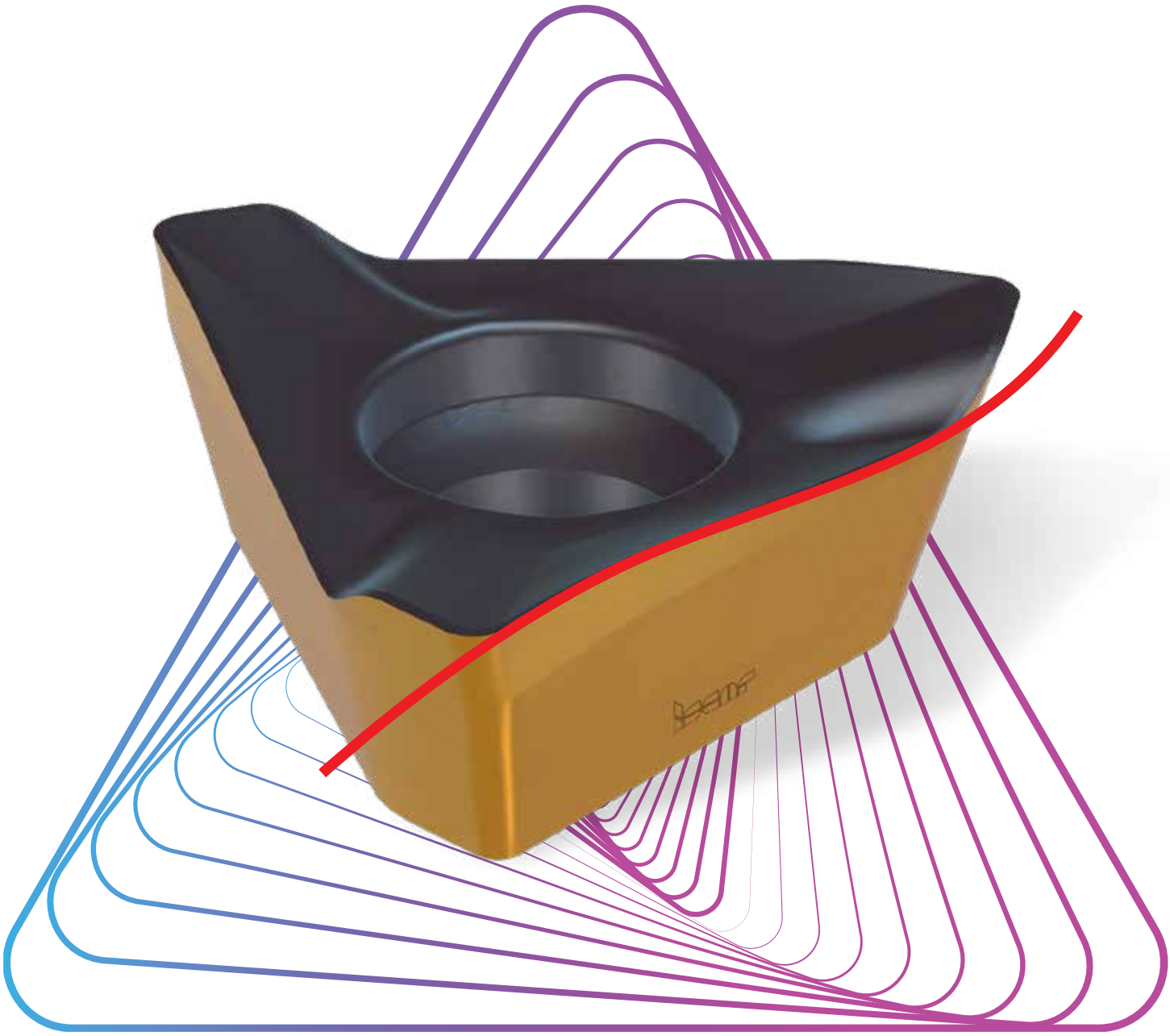

HELI2000

The **HELI-MILL** concept offers several advantages: consistent rake and relief angles reduce cutting force variations, uniform cutting wedges enhance strength, and the helical cutting edge improves accuracy. Continuous improvements have made the helix more aggressive and top surfaces more intricate, combined with advanced carbide grades for higher performance. However, the parallelogram shape limited cutting edges to two. Adapting the helical edge to triangular inserts addressed this, providing three cutting edges and a wider central area for a larger clamping screw, strengthening the assembly and enhancing ramping-down capability. Overall, ISCAR's

HELI-MILL and its advancements revolutionized the milling tool industry, improving performance, accuracy, and durability with helical cutting edges and triangular inserts. The **HELI-3-MILL**, featuring triangular inserts, has gained market popularity. However, the traditional parallelogram shape with helical edges still has its competitive advantages and won't be completely replaced soon.

The narrow width of the parallelogram insert, seen as a drawback compared to the triangular shape, offers advantages: suitability for smaller tool diameters, stronger tool bodies due to reduced chip gullet depth, and increased corner radii. It's ideal for high feed milling (HFM) inserts, transforming a 90-degree tool into an efficient HFM cutter. Additionally, the parallelogram has a smaller overall length than the triangle for the same cutting length.

HELI3MILL
HM390 LINE



Dismissing classical parallelogram inserts would be premature. The development of 90-degree indexable milling cutters blends triangular and parallelogram inserts. While triangular inserts dominate modern designs, parallelogram inserts remain relevant. ISCAR's new products with parallelogram inserts show this traditional design meets modern manufacturing demands. Milling high-temperature superalloys, titanium, and difficult-to-cut steels benefit from effective coolant supply, especially pinpointed high-pressure cooling, to reduce heat load and improve lubrication and chip removal.

Pinpointed coolant outlets

Higher cutting data and larger radial engagements result in a higher metal removal rate (MRR). HPC also produces tighter, curled chips, enabling smaller chip gullets and higher tooth density. ISCAR has expanded its **HELI2000** family by introducing tools with high-pressure cooling (HPC) optimized using computational fluid dynamics (CFD). These tools are available in integral-body configurations and as exchangeable heads compatible with ISCAR's **MULTI-MASTER** and **FLEX-FIT** systems.

MULTI-MASTER

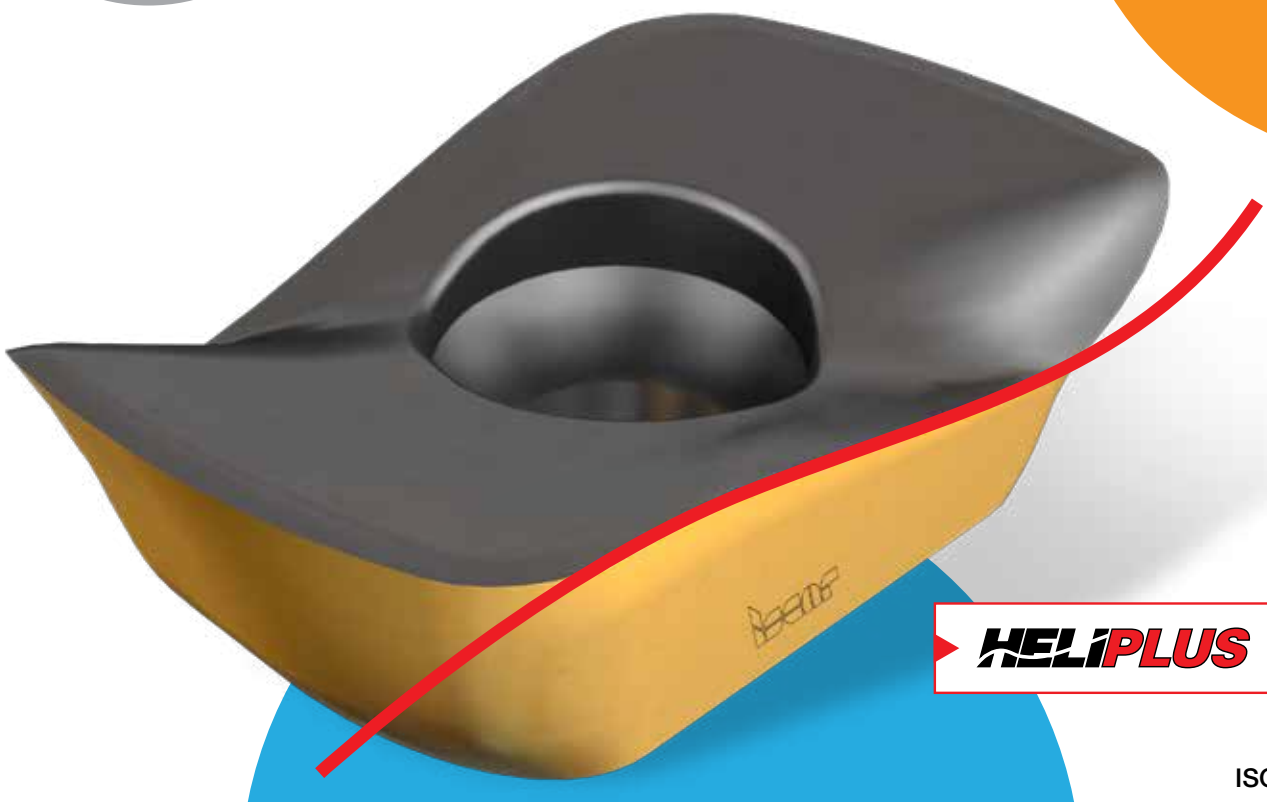
FLEXFIT

HELI2000 combines the latest developments from the **HELI-MILL** and **HELI-PLUS** families, including new carbide grades IC5600 for steel and IC716 for titanium. The insert range now features high positive chipformers for titanium, chip-splitting edges for roughing, and reinforced edges for high feed milling of hard materials. **HELI-ALU**, part of this expansion, includes milling tools with parallelogram-shaped inserts for aluminum alloys, and indexable endmill heads with threaded adaptations for **MULTI-MASTER** and **FLEX-FIT** systems, offering high-pressure cooling (HPC). The screw-in design enhances customization, allowing various shanks, adaptors, extensions, and reducers. The development of the "helical parallelogram" continues, advancing traditional **HELI-MILL** tools.

N

P

H

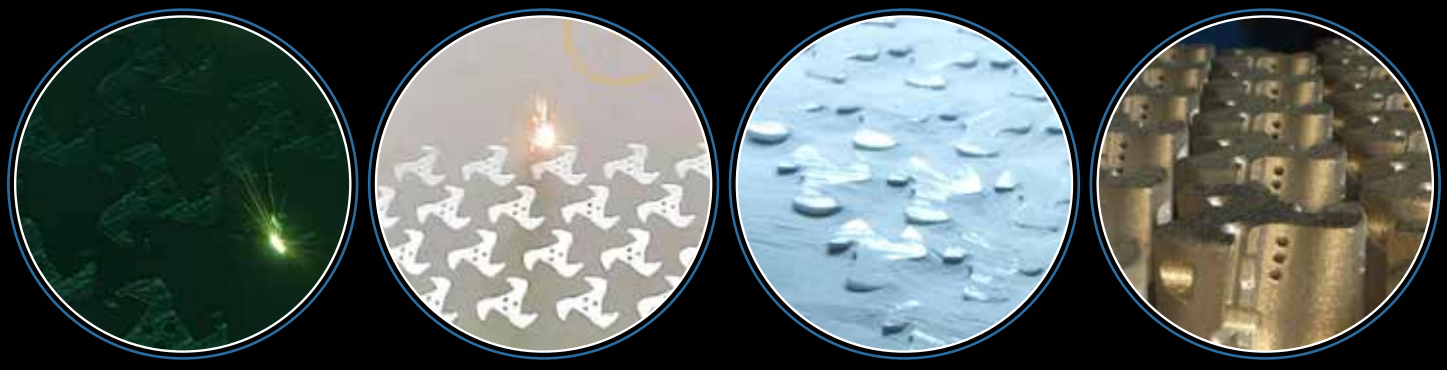


HELIPLUS

NEW DEVELOPMENT BENCHMARKS IN MILLING

Modern milling, as a metal cutting method, originated in the late 18th century and quickly became one of the primary machining technologies. Today, it is hard to imagine any machine shop without milling machines on the shop floor. Milling is an essential process in manufacturing.

Milling, is an integral part of machining technology, driven by the increasing demands of manufacturing. However, there are specific aspects that uniquely impact the advancement of milling.

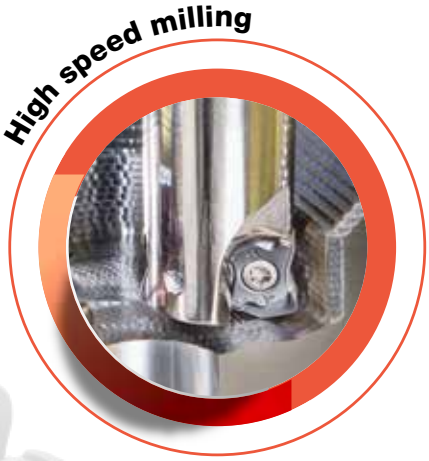


Today, we are witnessing significant changes in manufacturing that will have profound consequences on the development of milling. These changes are driven by various factors such as the increasing accuracy of metal shaping through precision investment cutting and precision forging, the widespread adoption of 3D printing, the growing usage of new composite and sintered materials, the need to enhance productivity in machining hard-to-cut superalloys and titanium grades, and the strong focus on electric and hybrid cars in the automotive industry. Additionally, advancements in multi-axis machine tools have opened up new possibilities for precise machining of complex parts and enabled the implementation of new cutting strategies to improve productivity. In modern technological processes, there is a tendency to significantly reduce the amount of machining stock intended for milling operations while simultaneously increasing the requirements for surface finish and accuracy.

QUICK 3D

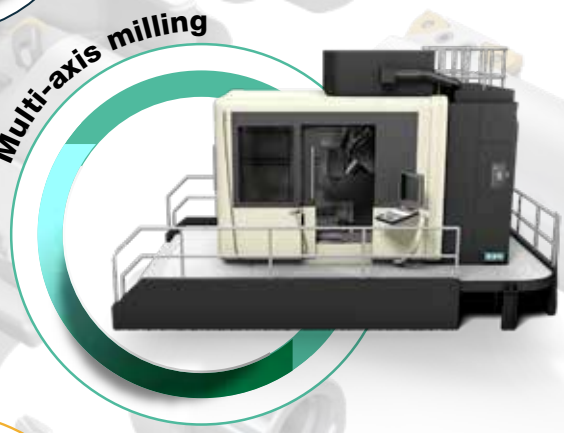
Therefore, the advancement in milling is driven by the need for higher productivity, more precision, and sustainability in milling operations. Consequently, the main developments in milling can be characterized as follows:

Fast metal removal focuses on boosting the metal removal rate (MRR) to achieve higher productivity by significantly increasing cutting speed or feed per tooth. This is achieved through techniques such as high speed milling (HSM) and, in rough operations, high feed milling (HFM).



Precision milling provides higher accuracy in milling operations.

Multi-axis milling is characterized by the utilization of multi-axis machining centers to enable complex milling operations.



Adaptive milling aims to develop intelligent milling systems that can adapt to changing conditions during the machining process.

Sustainable milling strives to reduce the environmental impact of milling operations. It involves the development of eco-friendly cutting fluids, recycling and reusing of materials, and the use of energy-efficient machine tools and milling cutters.

Success in these areas relies on the synergy of machine tools, cutting tools, and computer-aided engineering (CAE) systems. High-speed milling requires advanced machine tool technologies, cutting materials, and coatings. Precision milling demands cutters with tighter tolerances, improved control systems, and linear motor drives. Multi-axis milling benefits from effectively controlled axes and appropriate cutting geometries. Adaptive milling uses advanced monitoring systems, sensors, and algorithms to optimize cutting in real-time. Sustainability advancements require energy-efficient strategies, suitable tools, and eco-friendly coolant techniques.

Indexable milling reflects the ways of advancement that feature exchangeable cutting inserts in machining operations.

- Advanced insert materials is an ongoing process to improve the cutting materials for indexable milling inserts including the development of advanced carbide grades, ceramics, and ultra hard cutting materials.
- Coating technologies with continuous R&D focuses on new coatings to improve wear and heat resistance while enhancing lubricity.
- Progressive cutting geometry optimizes cutting geometry and chip forming topology of inserts to improve cutting action, diminish cutting forces, and chip flow in milling operations.
- The effective utilization of cutting material incorporates intelligent insert design to provide maximum indexable cutting edges without reducing cutting capabilities.

Smart manufacturing requires integrating digitization into milling operations and tools, with digital twins and software as essential features. How can cutting tool producers meet these challenges and emerging trends? ISCAR's recent advancements provide insights. High-speed trochoidal milling, which follows a curvilinear tool path to maintain a constant load on the cutting edge, is efficient for milling deep slots, pockets, and cavities, especially with low machining stability. It also excels with challenging materials like hard steels and high-temperature superalloys (HTSA).

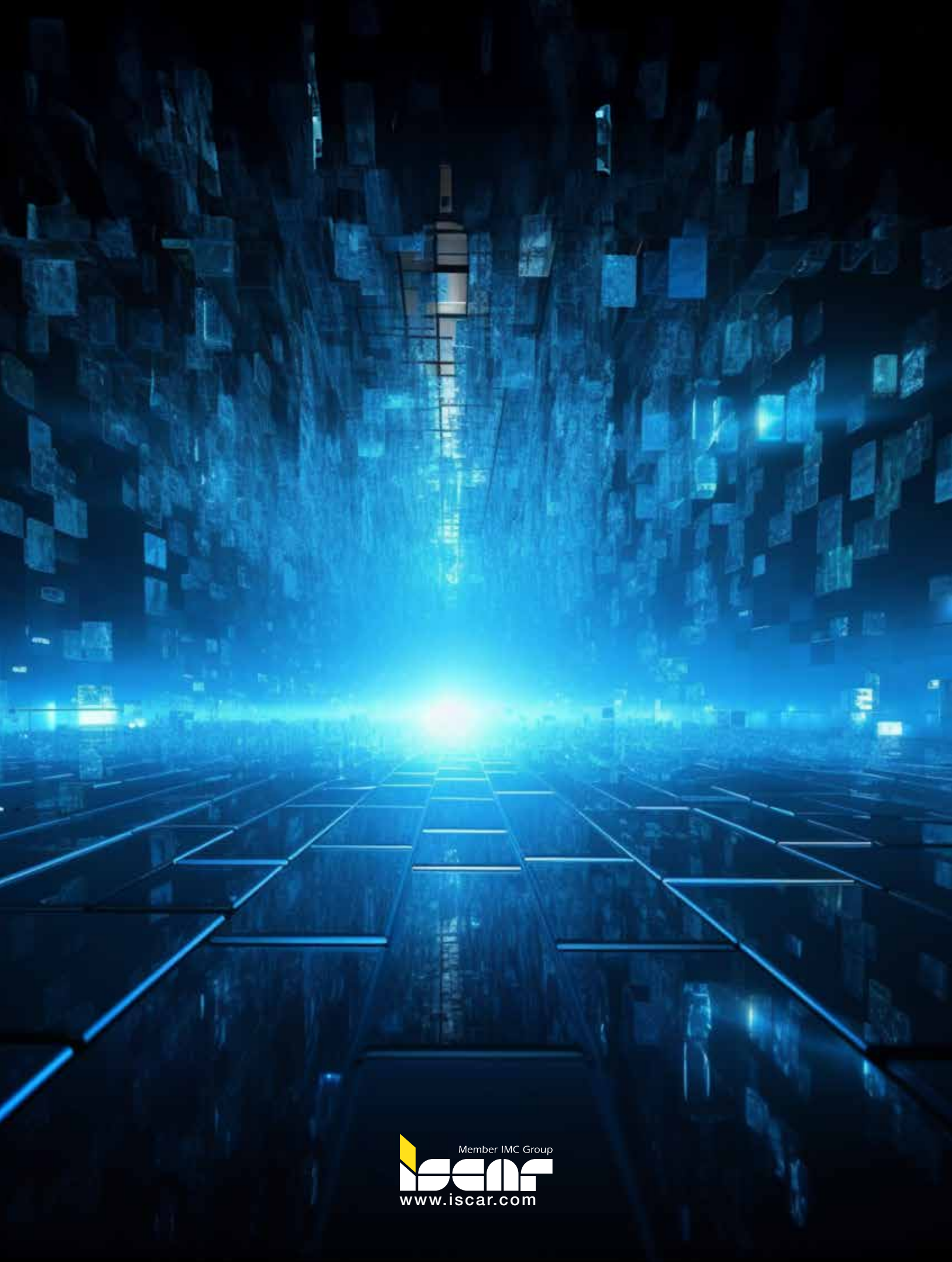
CHATTERFREE
SOLID MILL LINE

The **CHATTER-FREE** EC-E7/H7-CF is a new family of multi-flute solid carbide endmills, which are intended specially for trochoidal milling techniques. The geometrical design of the family includes different helix angles and variable angular pitches to improve dynamic behavior. These endmills are available in a range of cutting length-to-diameter ratios.

With the help of modern machine tools, highly productive milling of aluminum alloys can be achieved at extremely high spindle speeds, reaching up to 33000 rpm. To meet this machining challenge, ISCAR has developed 90° indexable milling cutters that accommodate large-size inserts for a depth of cut of up to 22 mm (.870"). The cutters have been specifically designed to eliminate insert radial displacement, which may occur due to the high centrifugal forces generated during very high rotational speeds.

High feed milling (HFM) is widely used for efficient rough machining of complex and flat surfaces. ISCAR's HFM range has expanded with new additions. The **LOGIQ-4-FEED** family now includes tools with larger, bone-shaped inserts, ideal for high feed milling of large cavities in the Die and Mold industry. Another addition, **NEO-FEED**, features double-sided square inserts with 8 cutting edges for improved cost-effectiveness.

Advancements in multi-axis machine tools and CAD/CAM systems enable precise milling of complex shapes with minimal stock, using segment or barrel-shaped endmills. ISCAR's program includes solid carbide designs, exchangeable **MULTI-MASTER** heads, and one-insert approaches. For high-temperature superalloys (HTSA), ISCAR's latest ceramic tools, including solid endmills and indexable cutters with double-sided round inserts, allow cutting speeds up to 1000 m/min (3300 sfm). These tools utilize ceramic grades like black ceramic, whisker-reinforced ceramic, and SiAlON. These examples highlight advancements in milling tools, driven by new demands and innovative designs.


Member IMC Group
ISCAR
www.iscar.com