

WELCOME ²⁰²⁶ TO ISCAR'S WORLD

**Rising Carbide Prices
Shouldn't Cut into Your
Profit**
[pg. 4]

**Achieving the Hole
Solution with Deep
Hole Drilling**
[pg. 8]

**Cutting Tools for
High-Speed Aluminum
Milling**
[pg. 18]

**New Product
Highlights**
[pg. 24]



MINIMUM COST

MAXIMUM OUTPUT

MORE PERFORMANCE
PRODUCTIVITY
PROFITABILITY

MAX VALUE

Contents

- 04** Rising Carbide Prices Shouldn't Cut into Your Profits
- 08** Achieving the Hole Solution with Deep Hole Drilling
- 14** From CAD/CAM to Tool Assembly:
Modern Times Require Modern Solutions
- 18** Cutting Tools for High-Speed Aluminum Milling
- 24** New Product Highlights
- 28** Machining Aluminum Wheels with ISCAR for Advance
Productivity and Quality

Rising Carbide Prices Shouldn't Cut into Your Profits

Raw tungsten material pricing continues to climb, and for many shops that pressure shows up quickly right on the bottom line. When raw material costs rise, the gap between a “good enough” machining setup and a truly optimized one becomes measurable in dollars per part, spindle uptime, and how often tools are being changed. In today’s environment, productivity and tooling strategies aren’t just technical decisions they’re margin protection.

ISCAR is addressing this challenge head-on with its MAXOUT strategy, a calculated approach designed to help manufacturers achieve MINIMUM COST and MAXIMUM OUTPUT. The message is simple: **when you choose ISCAR, MAXOUT becomes MAXVALUE: higher productivity and improved machining economics.**

ISCAR's MAXOUT strategy provides productive, stable machining with improved tool economy for turning, milling, holmaking, parting, and grooving.

ISCAR's approach centers on stable, repeatable machining performance that supports aggressive cutting data while protecting consistency and tool life. The goal is to maintain throughput even when input costs are moving in the wrong direction, using tooling solutions that balance performance with economics.



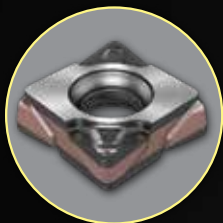
MAXOUT



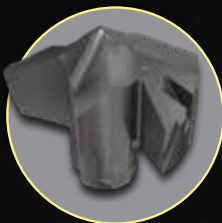
MAXVALUE

MINIMUM COST

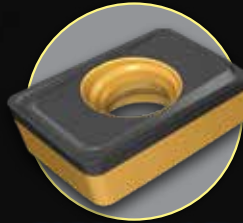
MAXIMUM OUTPUT



LOGIQ-4-TURN



SUMO-CHAM



QUICK-D-MILL



PENTA-CUT



MAXIMUM OUTPUT: More Parts

High-performance turning geometries combined with rigid, stable setups help shops increase feeds and speeds without sacrificing process stability. The payoff shows up in shorter cycle times, improved chip control, and more parts out the door per shift. More parts, less time.



MINIMUM COST: Spend Less Per Cutting Edge

The cost of tooling, specifically solid round endmills and drills, increase significantly when carbide prices rise. Substituting these expensive tools for indexable insert options reduces cost since only the cutting edge is replaced not the entire tool. In many cases, ISCAR's indexable options can meet the machining economics of the best round tools reducing cost per cutting edge, improving tool utilization and reducing disposal requirements for used tools. ISCAR solutions help stretch tooling budgets further while maintaining production demands. More parts, less carbide used, less tooling cost.

MAXVALUE: Repeatable Results That Protect Quality

Repeatability is critical, especially in long-running production. ISCAR's insert grades and geometries are engineered for reliable, consistent results supporting predictable surface finish and dimensional control while reducing the risk of rework and scrap. With the rising cost of inputs in the machining process, rejected parts are not acceptable. Consistency of process is a competitive advantage.

Less inputs, less time, MAXVALUE.

When rising material costs squeeze margins ISCAR's MAXOUT strategy is a practical way to maximize machining performance and minimize machine shop inputs.





**Stop Profit Erosion,
MAXOUT Your Machining Performance
With ISCAR.**



Achieving the Hole Solution with Deep Hole Drilling

Determining which drilling operations qualify as deep drilling is not straightforward. Traditionally, operations involving holes with a depth-to-diameter ratio of 5 or greater were considered deep drilling. However, advancements in metal cutting technology have extended this level to holes with depths of 10 or even 12 times the diameter. Today, the term "deep drilling" refers not only to the production of particularly deep holes, but also to the specialized methods used for both relatively "short" and truly "deep" holes. In addition to the challenges present in all drilling operations, deep drilling has its own specific difficulties.

One major issue is problematic chip evacuation. In deep drilling, chips that become clogged in the machined hole worsen the surface finish and may cause drill breakage. The "pecking" drilling method can help, but it decreases productivity and increases machining costs. Another challenge is restricted coolant supply, which not only reduces the cooling and lubrication needed for effective cutting but also affects chip evacuation. Also, decreased drill rigidity can lead to drill deflection, drill "walking," and vibrations - all of which negatively impact machining accuracy and tool life.





These challenges drive the development of advanced deep drilling tools. New designs focus on efficient and reliable chip removal to prevent clogging, targeted coolant supply to improve cooling and lubrication and to contribute to efficient chip evacuation, increased tool rigidity to withstand bending and vibration loads, and the use of advanced cutting materials to boost

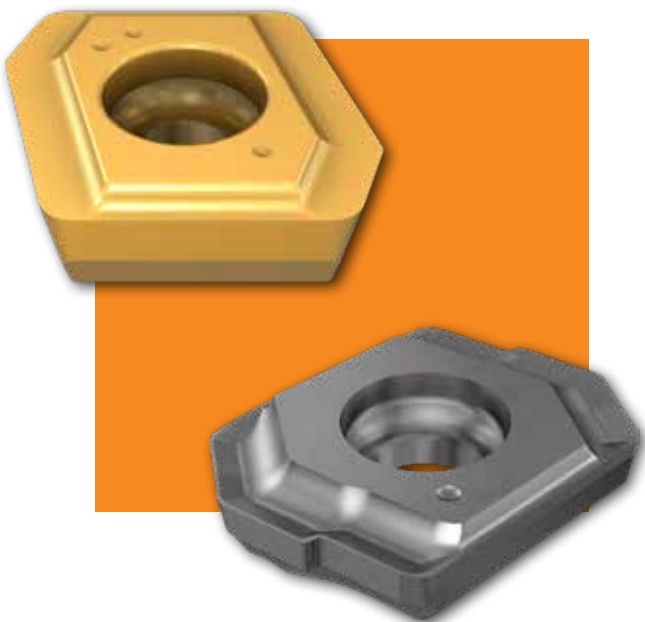
tool life. As a result, innovations include optimized flute geometries, enhanced chip-splitting cutting edges, sophisticated internal coolant channels, state-of-the-art coatings for carbide grades, and other new features. The latest products expanding ISCAR's deep drilling tool line exemplify these ongoing innovation trends.



New Carbide Grades Improve Wear Resistance

Recently, ISCAR introduced two new carbide grades specifically developed for BTA deep drilling tools. The first, IC948, is intended for machining steel and stainless steel (ISO P and ISO M application groups) using drilling heads with brazed carbide tips or indexable inserts. This grade features a submicron substrate and a nano-layered TiAlCrN PVD coating, providing high resistance to oxidation wear and chipping.

The second grade, IC8355, is designed primarily for drilling carbon and alloy steels, as well as martensitic and ferritic stainless steels (ISO P application group) by using heads that mount indexable inserts. Its multi-layer CVD coating, combined with a post-coating treatment, enhances resistance to abrasion and fracture wear, resulting in prolonged tool life when machining at medium to high cutting speeds.



Extra Long

Extra-Long Solid Carbide Drills Boost Machining Performance

Solid design predominates in deep drills with small diameters, typically up to 12 mm. Naturally, a one-piece structure offers the highest rigidity among accessible solutions. However, maximizing stiffness, ensuring effective chip removal, and providing precise coolant supply in small-diameter solid deep drills present considerable difficulties, especially given the limited design options available.

ISCAR's latest additions to the solid carbide deep drill program include extra-long twist drills with cutting depth-to-diameter ratios of 30, 40, and 50, corresponding to diameter ranges of 3–10 mm (.125-.391"), 3–8 mm (.125-.312"), and 4–6 mm (.172-.250"), respectively.

The drills have a 135-degree point angle, double-margin design, polished flutes, and helical internal coolant channels. These integrated features enable stable and productive drilling of deep holes of small diameters in solid components, made mainly from steel (ISO P application group).

Recently, ISCAR has expanded the solid deep drill family by new drills for machining cast iron (ISO K application group). The drills incorporate polished flutes and coolant channels, as mentioned above, and also feature a triple-margin design and a low flute helix to further increase rigidity and optimize drilling performance - including applications with inclined entrances or exits, as well as cases with cross holes. The introduced drills are available in diameters ranging from 3–12 mm (.125-.472"), with cutting depth-to-diameter ratios of 16, 20, and 30.

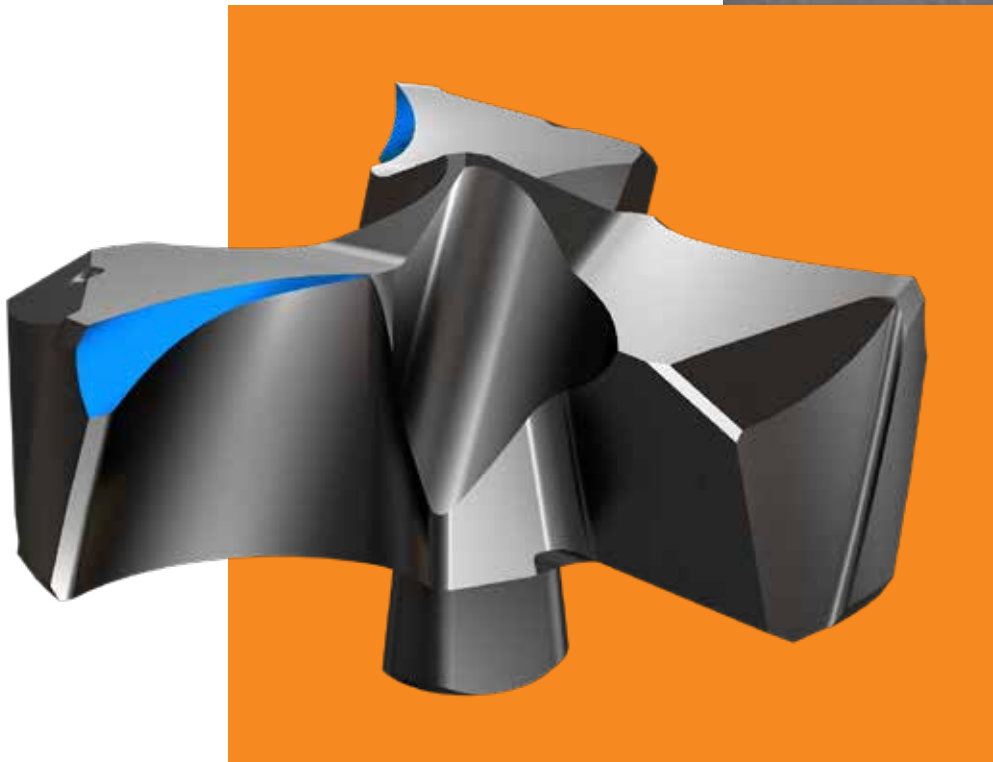


Three-Flute Concept for Higher Productivity

When looking to enhance the productivity of a standard two-flute drill after all other options have been explored, increasing the number of flutes is an intuitive next step that comes to mind. However, raising the metal removal rate (MRR) requires more space for effective chip evacuation – in other words, a larger flute volume, which diminishes structural behavior of a drill, especially in long-reach applications.

The latest addition to the QUICK-3-CHAM family of assembled drills with exchangeable three-flute carbide heads demonstrates an effective balance. Its unique flute design minimizes any impact on strength and rigidity, enabling significant productivity gains when drilling holes up to 10 times the tool diameter deep. As a result, the MRR can be increased by up to 50%.

The logo for QUICK3CHAM, featuring the word "QUICK" in orange, "3" in a large, stylized orange font, and "CHAM" in grey.

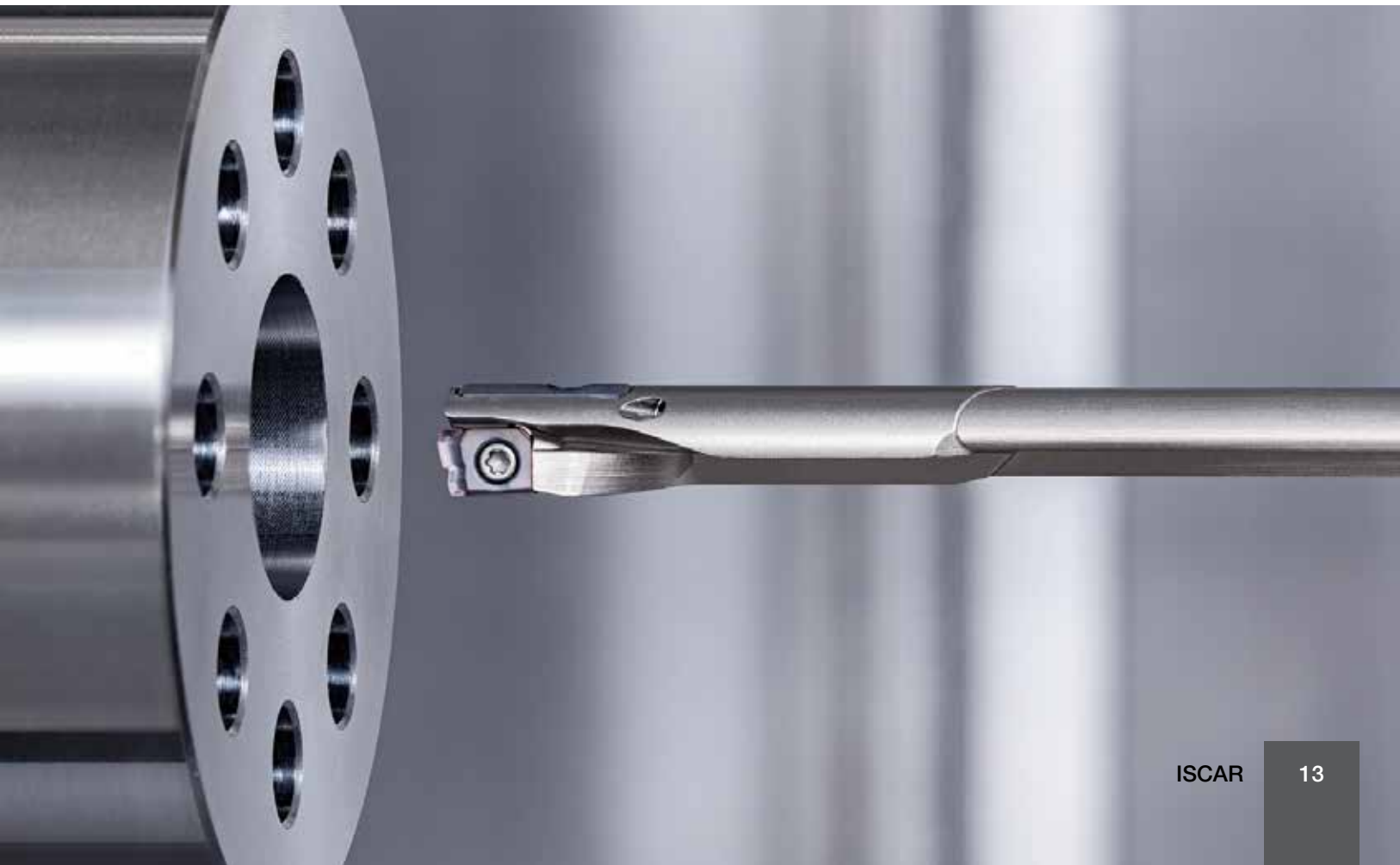


A Beneficial Combination

In deep drilling, producing narrow chips significantly improves chip evacuation, enabling higher feed rates and increased productivity. Therefore, to achieve this, a chip-splitting geometry on the cutting edge has been adopted in various ISCAR deep drill designs, particularly in the latest gundrills with replaceable carbide inserts of TRIDEEP line. These inserts incorporate a main cutting edge with a chip-splitting design and a secondary wiper edge intended to provide a fine surface finish. The inserts are made from the advanced IC948 carbide grade. Compared to previous gundrill designs, the new tools offer a reinforced body to enhance strength and prevent deflection.

The combination of the chip-splitting effect, advanced carbide grade, and reinforced body structure greatly contributes to higher MRR when drilling deep holes. Tools in the standard gundrill line are designed for productive machining of holes with a depth-to-diameter ratio of up to 25. Additionally, ISCAR offers customized TRIDEEP solutions for drilling to depths of up to 1650 mm (65").

Deep drilling has long been a truly "deep problem" - a significant challenge for manufacturers. However, ISCAR's new tools offer reliable solutions to overcome this challenge and make deep drilling operations much more efficient.



From CAD/CAM to Tool Assembly: Modern Times Require Modern Solutions

New times dictate new demands for cutting tool manufacturers. Simply supplying tools and assisting in their application, including planning machining operations, is not enough – the modern metalworking industry requires virtual, non-material solutions that will be an essential feature of product lines tomorrow.

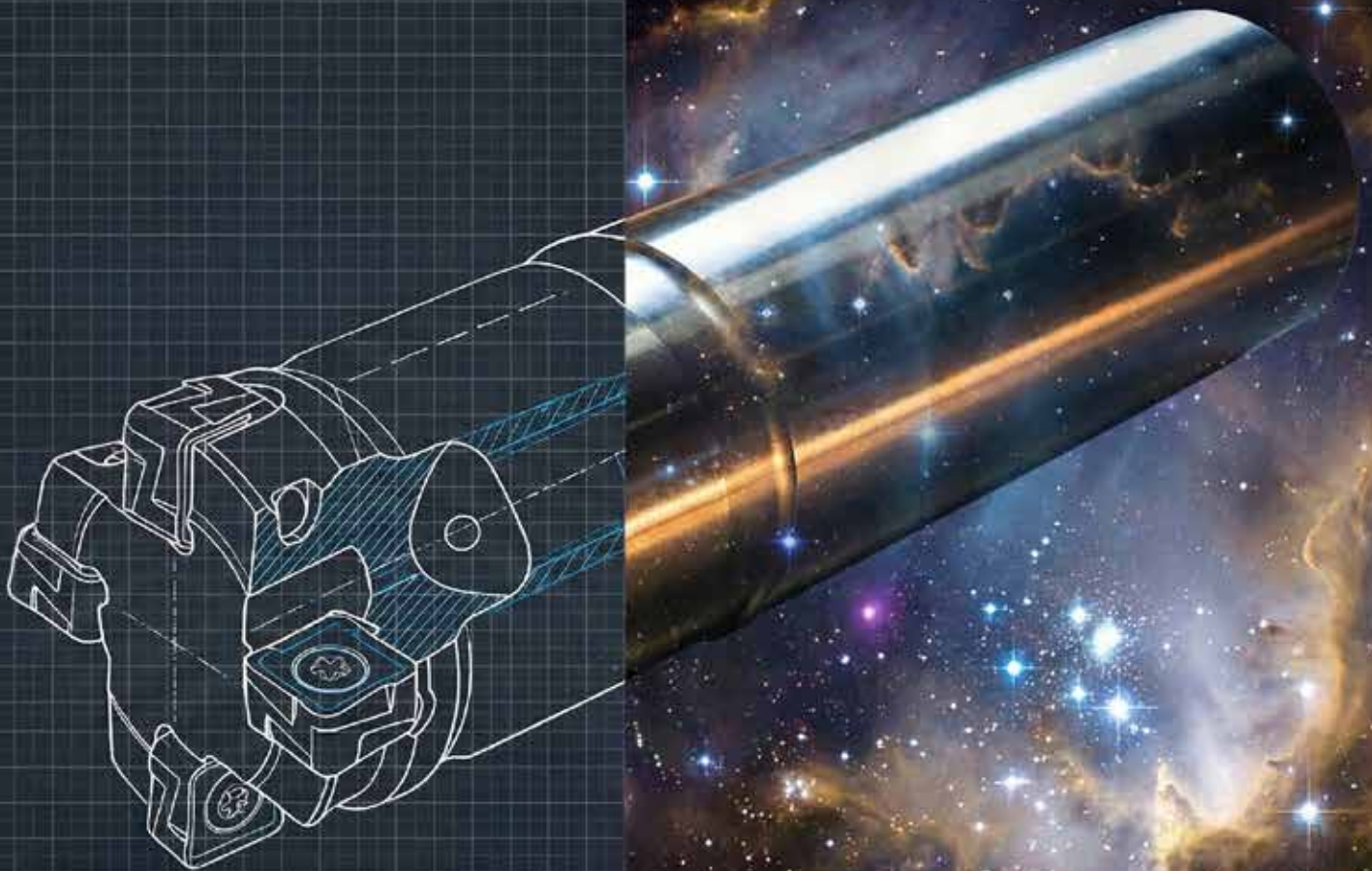
Digitizing of manufacturing industries, a clear trend of today's reality, is one of the distinct technological breakthroughs stimulated by the “fourth industrial revolution” - the implementation of INDUSTRY 4.0 standards.

The wind of change has transformed already even a relatively conservative industrial sector: metalworking. As machining continues to be an essential method in metalworking technology, cutting tool manufacturing, which provides tools for this method, has faced a necessity to meet new requirements. Consequently the information that specifies the tools should be unified and digitized in the same manner. Information interoperability is the key to ensuring a relevant data exchange between different components of today and tomorrow's smart manufacturing processes.



The **ISO 13399** standard specifies data representation for cutting tools and tool holders, in a manner that will ensure platform independence universally. The main target is to create a computer representation of the tools and the holders that is unified and understandable for various elements of metalworking technology, whether they are real or virtual, including computer aided design and manufacturing (**CAD/CAM**) systems.

From technologists working on process planning, engineers designing tool assemblies or preparing the tooling part of a complex key project and CNC programmers checking a tool path in a **CAD/CAM** environment, to application specialists optimizing machining operations and even sales managers assisting in selecting a more effective tool – all might spend hours adopting tool manufacturers tool data to the customer's software. Every **CAD/CAM** user needs to have immediate and simple access to digitized tool data, and this requirement has become of strategic importance in the service provided by a tool producer.



Data transfer

Essential data transfer is conducted via a STEP file with **.p21** extension, which stores text code related to the parametric values of the product. In addition, the **.p21** file provides the name of the 3D file of a specific product. **ISO 13399** stipulates the **.p21** file which can be transferred between computer platforms for CAD and CAM users.

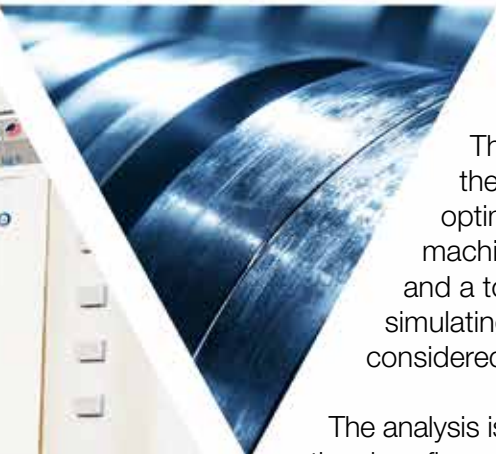
E-CAT Competencies

Recognizing the value of providing accessible and accurate tool data for pre-machining on the shop floors, ISCAR incorporated tool assembly options into “E-CAT”, the company’s comprehensive electronic catalog. This option enables users to build a tool assembly from various ISCAR products represented in E-CAT and then easily integrate the tool assembly data into their **CAD/CAM** system, which allows users to continue the analysis of applying the assembly to specific operations with the use of simulation software functions.

E-CAT represents an effective instrument for solving several tasks that are encountered by manufacturers today. The program integrates an advanced filtering system to enable the selection of the most suitable tools for the operation, based on machining parameters. The tool assembly includes the tool, exchangeable inserts or cutting heads, a toolholder and, if necessary, a reducer or an extension - all of which will optimally meet assembly specifications. For example, the system recognizes whether the toolholder selected will ensure the exact position of a clamped cutter, or whether the position should be changed by the user.

A digital twin representation of the tool assembly is generated based on the ISO 13399 standard, which is a guarantee of successful communication between current and future software support in a digitized smart factory.

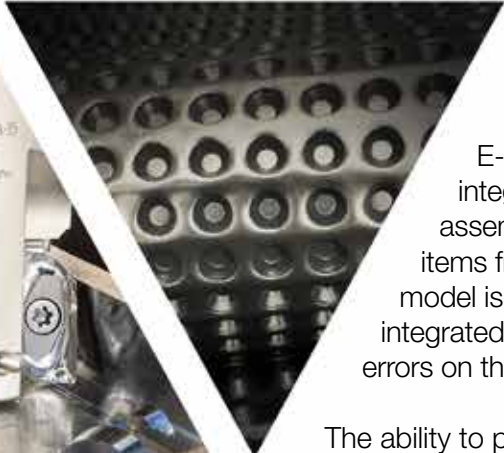




The **assembly** ensures ensure fast and reliable simulation of the operation as well as collision (interference) checking, tool path optimization, and the design of workholding fixtures. As the selected machining method results in the value of forces acting on workpieces, and a tool configuration influences the shape of workholding elements, simulating the operation with the use of the tool assembly model may be considered as an effective instrument for workholder design.

The analysis is performed in a **virtual manufacturing environment** and not on the shop floor, which minimizes and even prevents possible errors during real cutting.

The assemblies created are accessible for downloading in both **3D** and **2D** formats to facilitate the preparation of drawings, sketches, and other engineering documents.



E-CAT is simple and user-friendly, and even integrates a CAD function for creating a tool assembly from library elements that reflect standard items from the product lines. The tool assembly model is platform-independent and is intended to be integrated into the user's own CAM software, to prevent errors on the shop floor during machining.

The ability to plan and examine single- and multiple tool assemblies in the early stages of manufacturing is an extremely valuable source of time and cost saving. ISCAR believes that ensuring such a possibility should be an integral feature of any cutting tool manufacturer's product mix. The tool assembly options offer an appropriate and effective answer to the needs of modern metalworking, and more E-CAT tool assembly applications are near at hand to assist metalworking manufacturers in the evolving world of INDUSTRY 4.0.



Cutting Tools for High-Speed Aluminum Milling

High-speed milling (HSM) of aluminum and its alloys involves cutting speeds significantly higher than standard rates. This approach ensures efficient material removal and excellent surface finish and accuracy. While there is no strict definition for what constitutes HSM speeds, it is generally accepted that they range from 1.5 to 4 times typical values. Achieving HSM cutting speeds requires operating milling cutters at extremely high rotational velocities, often reaching 30,000 RPM or more.

From a design perspective, cutting tools for high speed milling (HSM) of aluminum and its alloys (collectively, aluminum) are typically classified into three types, as are general purpose milling cutters:

- Indexable tools
- Solid cutters, mostly solid carbide endmills
- (SCEM) assembled tools that mount replaceable, primarily tungsten carbide cutting heads (ISCAR's MULTI-MASTER products).

INDEXABLE TOOLS

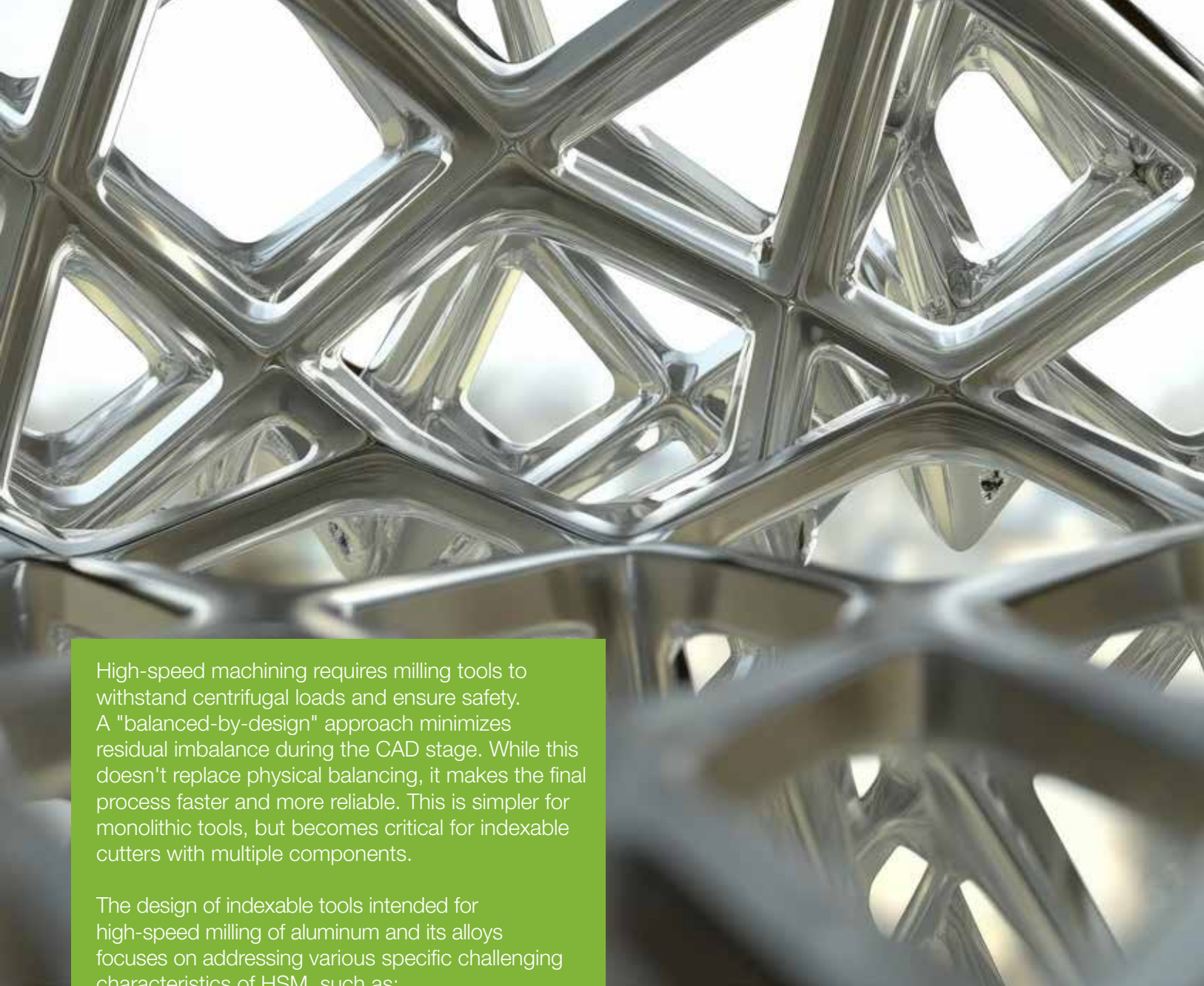


SOLID ENDMILLS



MULTI-MASTER





High-speed machining requires milling tools to withstand centrifugal loads and ensure safety. A "balanced-by-design" approach minimizes residual imbalance during the CAD stage. While this doesn't replace physical balancing, it makes the final process faster and more reliable. This is simpler for monolithic tools, but becomes critical for indexable cutters with multiple components.

The design of indexable tools intended for high-speed milling of aluminum and its alloys focuses on addressing various specific challenging characteristics of HSM, such as:



Preventing insert radial displacement caused by significant centrifugal forces.



Ensuring soft, light cutting action, even in operations requiring a long-reach tool configuration.



Reducing the mass of tool components to decrease centrifugal load.



Shaping internal coolant channels for the most effective coolant supply and others.



Optimizing the chip-gullet profile to maximize space for chip evacuation while maintaining the strength of the tool-body core.

A brief overview of ISCAR's products for indexable milling of aluminum provides an example of how the leading cutting tool manufacturers rise to the challenges. These products are categorized into three groups:

1. Multipurpose milling tools suitable for operation within the common range of cutting speeds.
2. High-efficiency HSM milling cutters are specifically engineered for use at extremely high cutting speeds.
3. Prolific milling tools with enhanced ramp-down capabilities, enabling cutting speeds that fall between the spans of the first two types.

The first group consists of general-duty cutters using indexable inserts for various materials. By varying rake and relief geometries, these tools adapt to specific machining needs, typically at speeds up to 1000 m/min.

For High-Speed Machining (HSM), the second group utilizes insert-retention mechanisms to prevent radial displacement from centrifugal forces, enabling speeds up to 5000 m/min. The third group is optimized for intensive ramp-down milling with aggressive geometries, reaching 2000 m/min.

In HSM, centrifugal loads necessitate frequent clamping screw replacement. ISCAR generally recommends replacement every ten insert changes, though high-tolerance matched sets require replacement with every new insert. Finally, balancing must involve the entire tooling system—including adaptors and extensions—per ISO 16084, rather than just the tool assembly itself.



QUICKDMILL

What new tools for high-speed milling of aluminum does ISCAR offer customers? Which of the above-mentioned groups is the focus of the latest developments?

The group of general-duty indexable milling cutters has been expanded with various original designs. For example, the range of tools carrying round inserts now includes new inserts intended for machining aluminum and other non-ferrous metals. These inserts, which feature a polished top (rake) face to improve chip flow and eliminate built-up edge (BUE) formation, are produced in two geometries: one with a plain cutting edge and one with a serrated cutting edge. Inserts with a plain edge are typically used for semi-finishing operations, while inserts with a serrated edge are primarily designed for roughing and for machining under unstable conditions, such as long-reach applications requiring high tool overhang and the machining of thin-walled workpieces.

HELIALU



MILLSHRED



Recently introduced endmill heads with MULTI-MASTER and FLEXFIT threaded connection, available with a high-pressure coolant (HPC) option, provide another example. These heads accept ISCAR's classic HELIALU inserts with a helical cutting edge. The coolant delivery design was upgraded, using computational fluid dynamics (CFD) modeling, to maximize flow rate while minimizing pressure drop. The screw-in configuration significantly broadens customization by enabling the use of MULTI-MASTER and FLEXFIT shanks, adapters, extensions, and reducers that are widely represented on the market.



Over the last years, ISCAR has emphasized a portfolio of indexable milling tools for aluminum designed for very high cutting speeds to boost metal removal rate (MRR). These tools are engineered to prevent radial insert movement caused by strong centrifugal forces.

A dedicated anti-movement locking mechanism ensures reliable cutting during extended high-speed machining (HSM) operations. The latest development expands the portfolio's performance with new tools that accept large inserts, enabling depths of cut up to 22 mm. This addition supports more effective utilization of modern, high-power machine tools with high-speed main drives.



The newest product, recently unveiled, is a 14 mm serrated insert designed to be mounted on existing HELIALU high-speed milling cutters. The insert combines a polished rake face, super-positive cutting geometry, and sharp serrated cutting edges for chip-splitting action. Breaking wide chips into small segments improves chip evacuation, reduces re-cutting, enhances the tool's dynamic stability, and enables higher feed rates, thereby increasing productivity in rough milling operations.



Naturally, solid carbide end mills (SCEM) and assembled tools with replaceable carbide heads are also undergoing continued development. Recent innovations include several SCEM and heads with various profiles. For example, a four-flute, 32 mm in diameter MULTI-MASTER head employs variable flute helix angles to improve dynamic stability, enabling consistent cutting across a wide range of operations from roughing to finishing.



Advances in machine tools have significantly expanded the limits of rotational velocity and feed rate, **allowing higher cutting speeds.**

Ultra-high-speed milling of aluminum is emerging as a guiding paradigm, which in turn places new demands on cutting-tool design. How tool manufacturers will meet these challenges remains to be seen.



New Product Highlights

ISCAR takes the time to “gather stones” to reflect on the past, evaluate our achievements, and look at the progress we’ve made. This is more than a tradition; it’s an important exercise that helps us recognize development trends, identify emerging patterns, and pave the way for setting our future direction.

We remain committed to our mission delivering innovation and value to the cutting tool industry. While true breakthroughs are not an everyday event, this year saw several noteworthy additions to our product portfolio, developments we are proud to share.





Cutting Materials - The Foundation of Our Tools
Developing advanced cutting material grades is a complex challenge that requires the close collaboration of our material engineers, metallurgists, and technologists. We have expanded our range of tungsten carbides, ceramics, and cubic boron nitride (CBN) grades.

Among 2025's key introductions:

- **IC1024** – Designed for turning hard steel up to HRC 62, this grade serves as a cost-effective alternative to ceramics and CBN.
- **IC706** – Featuring a titanium diboride coating, this grade enhances machining performance, particularly for titanium alloys.
- **IC948** – A strong boost to our deep drilling line, especially for ISO P and ISO M applications.

These additions strengthen our ability to meet the diverse needs of our customers and expand the performance envelope of our tools.



Turning – Noteworthy Additions

- **POMG Inserts** – ISCAR's new pentagonal, double-sided insert for DOVE-IQ-TURN tools offers ten indexable cutting edges for exceptional economy. The special periphery design ensures secure dovetail clamping under high loads. Two versions are available: one with a 14.5° entering angle for high-feed rough turning at shallow depths, and another with a 55° entering angle for rough-to-semi-finish work at standard depths.
- **QUICKTURN Tools** – Equipped with high-feed Q6-MNMG inserts, these tools feature a unique concave-hexagonal geometry for secure positioning and productive multi-directional turning, including profiling and facing under heavy cutting loads. In threading, our QUICK-THREAD line of multi-tooth, laydown, full-profile inserts for ISO Metric, ASME/ANSI Unified, National Pipe, and British Standard Whitworth threads can cut passes by up to 75%.

 **DOVE IQ TURN**
HEAVY DUTY LINE

Milling – Expanding Possibilities

Slot milling saw an exciting leap forward with the introduction of TANG-DISC tools. Using tangentially clamped carbide inserts and our SP spline connection for exchangeable heads, these tools deliver efficient, high-density cutting in the 25–50 mm diameter range, with internal coolant supply built in.

In face milling, we expanded our NEO-DO family with a smaller insert design that features eight indexable cutting edges and advanced geometry for lower cutting forces and superior performance. These tools cater to both face and square shoulder milling, even close to shoulders when space is restricted.

Across our milling lines, targeted coolant delivery optimized for high-pressure cooling (HPC) and minimum quantity lubrication (MQL) ensures peak performance when machining aerospace materials, heat-resistant superalloys (HRSA), titanium, stainless steels, and advanced aluminum alloys.

 **NEODO**



Holemaking – New Directions

Our drilling solutions with exchangeable carbide heads are already trusted worldwide. This year, we took our successful three-flute QUICK-3-CHAM design and brought it into countersinking with F3B heads. Mounted directly into existing tool bodies, they offer excellent straightness, concentricity, and surface finish. The special chip-deflector geometry makes counterboring more effective, breaking chips into small pieces even in sticky or difficult materials such as stainless steel and HRSA.



The Digital Dimension

ISCAR engineers believe every tool now has two parts: its physical form and its digital twin. That's why we continuously update our digital package combining e-catalogues, data exchange formats, and expert software to make tool selection, setup, and performance optimization easier.

We added new filtering options to our e-catalogue for faster, more precise tool searches. ISCAR's **NEOITA** expert system was also expanded to include T-slot milling applications, supporting decisions with cutting data, life prediction, and cost estimates.

Looking Ahead

ISCAR's focus is clear developing solutions that meet current demands and anticipate the needs of the future. The products we've introduced at the end of 2025 reflect our commitment to innovation, efficiency, and value. As we step into the coming year, we remain driven by the belief that even small advancements can create a big impact in the hands of our partners and customers.



Machining Aluminum Wheels with ISCAR for Advance Productivity and Quality

The aluminum wheels industry is experiencing rapid and sustained growth, driven by the constant demand for new vehicles across global markets. Consumers increasingly prefer stylish, lightweight, and high-performance wheels, which has led manufacturers to expand production capacity and adopt more efficient manufacturing processes. This market expansion, however, comes with intense competition, as manufacturers must balance the demands for greater cost efficiency with the need to deliver superior quality. The price of an aluminum wheel is influenced not only by raw material costs but also by the machining technology and production methods employed in its manufacture.

Aluminum wheel manufacturers operate in a fast-paced production environment where precision, surface quality, and cycle times significantly affect profitability. They must meet the automotive industry's stringent dimensional and aesthetic standards while ensuring that production remains efficient and cost-effective. This requires tools and systems that can accommodate high cutting speeds, withstand heavy cutting forces, maintain consistent performance, and deliver a flawless finish that enhances the wheel's appearance. These challenges are compounded by the trend toward mass customization, where different wheel designs, sizes, and finishes must be produced with minimal downtime and setup changes.

ISCAR addresses these industry needs by providing advanced, cost-effective machining solutions specifically developed for aluminum wheel production. The company's tool systems are engineered to optimize productivity, extend tool life, and consistently produce superior surface quality in demanding machining operations. ISCAR's solutions cover the full range of wheel manufacturing processes, including outer diameter and inner diameter machining, facing, undercutting, and the drilling of valves, lugs, and center holes.

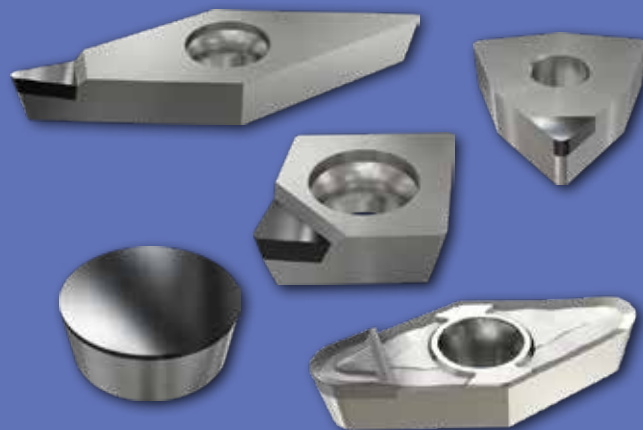


Among ISCAR's leading technologies is the DTF - Quick Change Toolholder system, designed for speed, stability, and accuracy in high-volume production. This system is particularly well-suited for automatic machining stations, where stable tool life is essential. Its user-friendly design allows the operator to clamp or release tool heads using a single screw, drastically reducing changeover time. The system's dovetail face contact provides maximum rigidity and stability, ensuring precise machining under both axial and radial forces. DTF tools are compatible with ISCAR's GRIP and ISO insert families and are suitable for use with emulsion and Minimum Quantity Lubrication (MQL) systems. This makes them a favored choice among aluminum wheel manufacturers seeking to improve efficiency without compromising performance.

Maintaining the correct temperature during aluminum machining is crucial for achieving the high surface quality required in wheel production. ISCAR's DTF tooling integrates a targeted coolant supply that delivers coolant directly to the cutting edge, reducing heat buildup, improving chip evacuation, and prolonging tool life. This precision cooling approach supports both productivity and product quality.

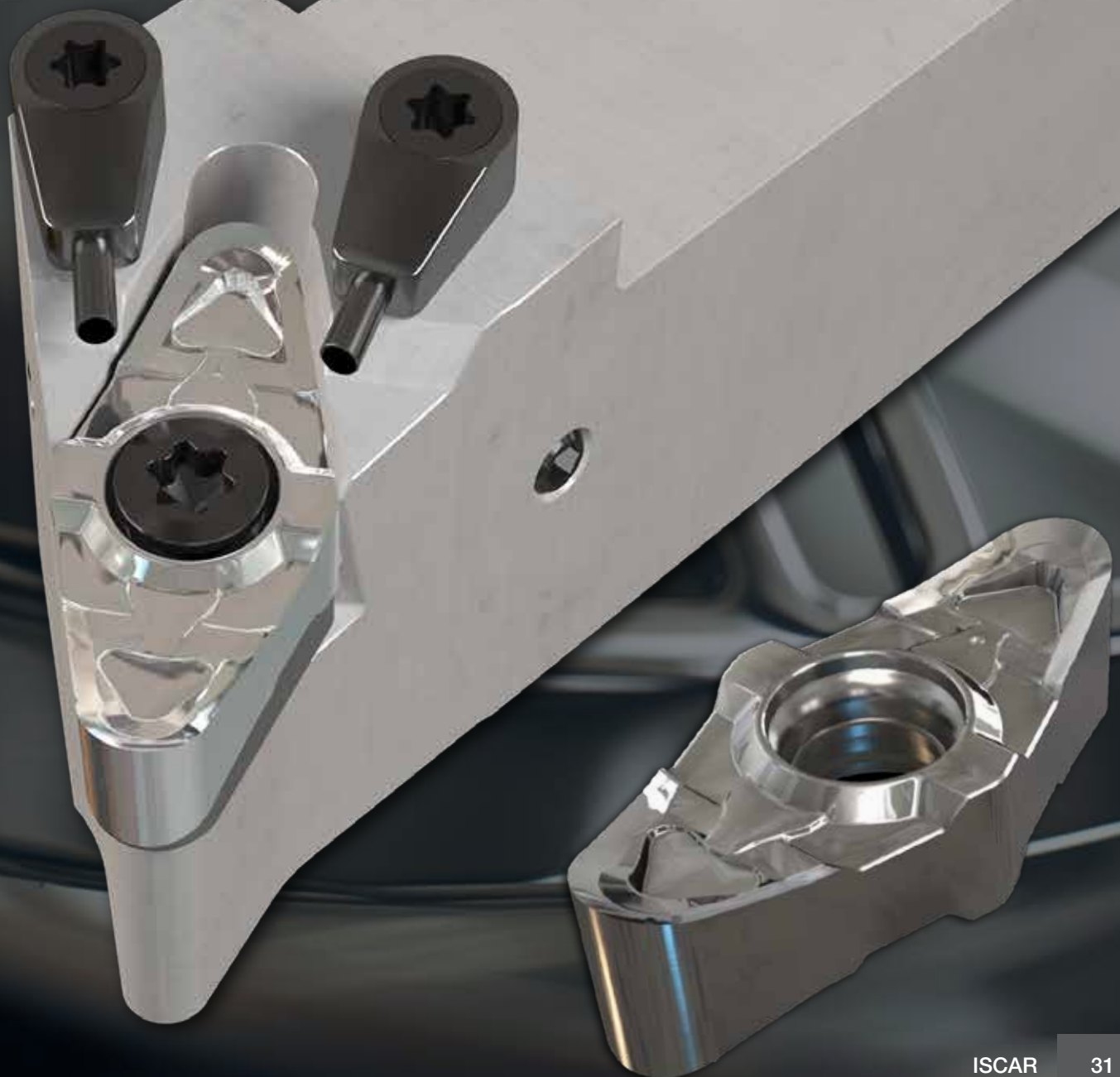


performance, ISCAR recommends Polycrystalline Diamond (PCD) inserts. Designed for stability under high cutting conditions, PCD inserts are available in multiple geometries, including ISO 35° rhombic shapes and full-radius designs, with or without chipbreakers. These inserts can be used for roughing, semi-finishing, and finishing. Special bright-facing PCD inserts are also available to prevent surface porosity and burr formation after painting, ensuring that wheels meet the strict visual standards expected by both automakers and consumers.



For cost efficiency, ISCAR offers the VNGU ISO 35° rhombic insert, which features four cutting edges, a 7° positive flank, and a very positive rake angle. Its sharp, polished cutting edge is engineered for aluminum wheel machining, delivering improved chip control under high-pressure coolant, extended tool life, and excellent finish - all while lowering per-part costs.

 **ALUPTURN**
POSITIVE DOUBLE SIDED





ISCAR also provides a complete range of drilling solutions tailored to the specific needs of aluminum wheel manufacturers. These drills are designed for the precision machining of center holes, lug holes, valve holes, and back chamfering. They are available in solid carbide, indexable insert, and PCD-tipped designs, offering flexibility across varying production requirements.

To ensure peak performance across different aluminum machining conditions, ISCAR's cutting tool grades are formulated for specific applications. These include IC20, an uncoated carbide grade for medium to high cutting speeds; IC04, a hard submicron carbide for titanium, high-temperature alloys, and aluminum; and IC07, another hard submicron carbide suitable for similar applications at medium to high speeds. The ID5 grade features a PCD brazed tip for very high cutting speeds, while IC1520 is DLC-coated to extend tool life during medium to high-speed aluminum machining.

In addition, ISCAR places special emphasis on the quality of the cutting edge of the inserts. Most of ISCAR's aluminum machining inserts are precision-ground to be extremely sharp, with positive edge geometries specifically designed to prevent material buildup on the cutting edge. Since aluminum is known to be a highly adhesive material during machining, these features ensure a clean, smooth, and uninterrupted cutting process. These are unique grinding profiles developed by ISCAR, providing a significant advantage in achieving high-quality, stable machining results.



SUMOCHAM



Furthermore, ISCAR's aluminum inserts are supplied with a polished top surface, which plays a critical role in facilitating smooth chip flow and preventing chip adhesion. This polished finish reduces friction between the chip and the insert surface, helping to evacuate chips more efficiently and maintain a clean cutting zone. This contributes to a softer, cleaner cut and minimizes the risk of built-up edge formation, an essential factor when machining sticky materials like aluminum.

As vehicle design trends evolve, the demand on aluminum wheel manufacturers will continue to rise. Faster production cycles, tighter tolerances, and flawless finishes are now industry norms.

ISCAR's integrated approach combining high cutting speeds, precision coolant delivery, rigid toolholding solutions, and advanced insert technologies gives manufacturers the competitive edge they need. By equipping production lines with ISCAR's specialized tooling systems, aluminum wheel producers can achieve higher productivity, reduced downtime, extended tool life, and consistently superior results, securing their position in a rapidly expanding and increasingly demanding global market.

 **MULTI-MASTER**



 **CUT-GRIP**

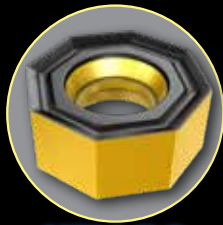


MINIMUM COST

MAXIMUM OUTPUT



LOGIQ-4-TURN



HELI-DO



ISO-TURN



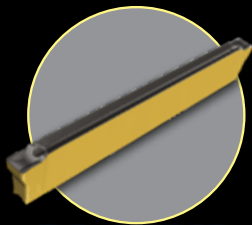
TANG-GRIP



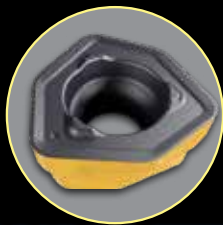
HELI-TANG



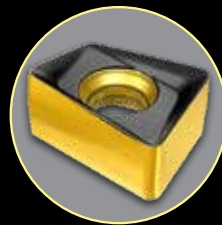
LOGIQ-6-TURN



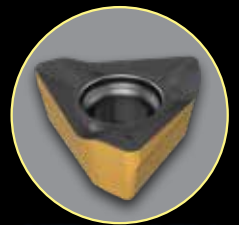
DO-GRIP XL



MICRO-3-FEED



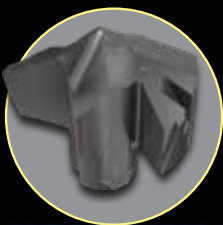
HELI-DO



HELI-3-MILL



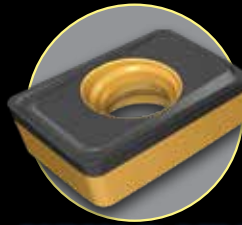
SLIM-GRIP



SUMO-CHAM



MULTI-MASTER



QUICK-D-MILL



PENTA-CUT