Make the RIGHT CHOICE

A Global Metalworking Company

In a world of different languages and different mentalities, it is important to have a fully equipped, knowledgeable local supplier to meet your needs. ISCAR knows this. We have subsidiary offices and agents located in 52 major industrial countries. In some of the larger countries, regional offices have been opened to bring ISCAR personnel and facilities as close as possible to customer production sites.

Many of our subsidiaries have fully equipped training centers. These centers are dedicated to providing a local location where metalworking personnel can be trained in the latest techniques and products for metal removal.

ISCAR has global manufacturing facilities in each of the following countries:

In Europe
- France
- Germany
- Italy
- Spain
- Switzerland
- Turkey
- Hungary
- Slovenia

In the Americas
- Argentina
- Brazil
- United States

In Asia
- South Korea
- China
- Israel
Strong Industry Powering the World

While the population of the world continues to grow, with 9.2 billion people expected by 2050, so does the average standard of living driven by a sustainable economic average in emerging and developed economies.

Investments in R&D and manufacturing technology are crucial to maintain a long term competitive advantage. While making these important investments, companies also have to focus on controlling costs, improving productivity and searching for new technologies.

There is a growing demand for machining exotic materials in the oil and gas industry, capable to withstand the most hostile environments such as high temperatures, corrosion and extreme pressure conditions.

For this purpose ISCAR brings its customers innovative tooling solutions, combined with the highest quality assurance standards worldwide.

The oil and gas industry is usually divided into 3 main segments, upstream, midstream and downstream. Midstream operations are usually included in the downstream category.

**Upstream**
- Exploration and production of crude oil and natural gas

**Midstream Pipeline**
- Transportation, storage and marketing of oil and gas derivatives

**Downstream LNG Plant**
- Refining crude oil, purifying and processing raw natural gas
This sector involves all the activities related to the exploration and production (E&P) of crude oil and natural gas. The upstream oil and gas segment include: exploration for potential underground or underwater oil and natural gas reservoirs, drilling of exploratory wells, and operating/producing the oil and natural gas wells that “pay” with crude oil and/or natural gas.

**Rock Bits**
(pages 8-9)

**Wellheads** X-MAS Tree
(pages 14-15)
Drill bits are part of the downhole equipment used to dig down into the earth’s crust. Like a common hand-held drill, the spinning of the drill bit allows for penetration of even the hardest rock. The drill bit is located at the bottom end of the drill string, and is responsible for actually making contact with the subsurface layers, and drilling through them. The drill bit is responsible for breaking up and dislodging rock, sediment, and anything else that may be encountered while drilling.

**Carbide Bit Holes**
Range: Ø6-32.9 mm (Ø.236-1.295“)

SUMOCHAM comprises a revolutionary clamping system that enables improvement in productivity output rates, while enabling more insert indexes. Uses standard 1.5xD drill head. Point angle can be offered from 130° up to 180° with corner radius.

**Slot Milling**
Range: Ø6-25.4 mm (Ø.0236-1.00“)

A family of tools with unique interchangeable heads, for a variety of milling applications including ball nose, straight shoulder, slitting and slotting applications.
External Rough Turning

**DOVE IQ TUR**

Heavy Duty Line

Rough turning is characterized by high D.O.C. 4-10 mm (0.157-0.393") and high feed rates 0.4-1.0 mm/rev (0.016 -0.0393 ipr). Large single-sided inserts are used to withstand interrupted cut and high machining load.

Deep Hole Drilling System*

Range: Ø8-300 mm (Ø.315-11.8")

**ISCAR DEEP DRILL**

DTS – Double Tube System -
Range: Ø18.41-168.99 mm
(Ø.724-6.65") IT9-IT10

STS – Single Tube System -
Range: Ø14.51-Ø245.99 mm
(Ø.571-Ø9.68"), IT9

DR-DH Deep Drills for Milling Centers and Lathe Machines

Range: Ø25-100 mm (Ø.984-3.94")

These long drills for a drilling depth-to-diameter ratio of 7XD and up, can be used on standard horizontal milling centers, turning, and multi-task machines. Use of supplementary machine and setup may be avoided.

* See page 18.
Welding Edge Preparation
Profile Milling Cutters
Innovative design based on precise exchangeable segments. Strong tangential inserts enhance the performance of these reliable tooling systems. Minimal cutting tool maintenance costs and fast segment replacement.

Skiving of External Weld Seam
A negative insert with 8 cutting edges to remove the burr right after the welding process (material temperature is usually 300-400°C (572-752°F). Cutting speed varies from 40-150 m/min (132-495 sfm), depending on the diameter of the tube.
Pipe Machining Solutions

External Rough Turning

**DOVE IQ TURN**

Rough turning is characterized by high D.O.C. 4-10 mm (0.157-0.393") and high feed rates 0.4-1.0 mm/rev (0.016 -0.0393 ipr). Large double-sided inserts are used to withstand interrupted cut and high machining load.

Oilfield Threading

**ISCAR THREAD**

ISCAR offers a wide range of API and premium profiles for the oil and gas industry. From single point through laydown triangular, to complex high accurate threading chasers, ISCAR’s threading line offers one of the best products in this application field.

 Tube End Cut-Off

**TANG-GRIP**

The revolutionary TANG-GRIP system has proven to be the utmost solution for heavy duty oilfield tubular goods cut-off application, providing very accurate grooving repeatability.

Welded Pipe

Seamless Pipe

Oil and Gas Industries
Charpy V-Notch Test
This standardized high strain rate test determines the amount of energy absorbed by a material during fracture. This absorbed energy is a measure of a given material's toughness and acts as a tool to study temperature-dependent ductile-brittle transition. It is widely applied in industry, since it is easy to prepare and conduct and results can be obtained quickly and cheaply.

Roughing Operation
Solid Carbide Milling
Range: Ø3-25 mm (Ø.113-.985”)

Revolutionary CHATTERFREE solid carbide endmills provide improved dampening performance, resulting in 20-25% longer tool life, even at large metal removal rates.

Finishing Operation
Solid Carbide Milling
Range: Ø6-25 mm (Ø.236-.984”)

ISCAR offers new 4 and 5 flute, 38° helix endmills with variable pitch for roughing and finishing operations. The new EC...CF solid endmills and MM EC...CF MULTI-MASTER milling heads feature excellent chatter dampening ability, due to their variable pitch.
**High Feed Turning**

**DOVEIQTURN**

HEAVY DUTY LINE

The new PWXOL 3232P-10-TF-IQ lever lock 18.5° lead angle toolholders for fast feed, up to 3 mm/rev (0.118” ipr) and up to 2.8 mm (0.110”) D.O.C., is the ultimate solution for longitudinal high feed turning.

**Internal Turning (Finishing)**

**ISOTURN**

ISCAR boring bars are equipped with internal coolant channels. The unique design extends tool life, improves chip flow and machining reliability.

**Laydown Threading**

**ISCARTHREAD**

ISCAR leads the way as the first choice cutting tool supplier, covering a wide range of intelligent cutting tool solutions, from external high output roughing rates through tight API and premium tolerance accuracy in threading.
The “easy oil” era has come to an end; nine out of ten of the world’s giant oil fields are being depleted. The next frontier relies on the deepwater and ultra-deepwater exploration research which is critical to unlocking more oil to meet the world’s growing demand.

**Double-Sided Triangular Milling Inserts with 6 Cutting Edges**

*Range: Ø50-200 mm (Ø1.96-7.87")*

This revolutionary design of triangular inserts, coupled with a rigid pocket design, provides extremely high durability and very stable performance. The tools can machine accurate 90° shoulders up to 14 mm (0.55") depth, and in addition perform slotting, ramping down and facing operations.

**Rough Boring**

The growing demand for machining H.T.A. (High Temperature Alloy) has led ISCAR to develop a unique ISO insert suitable for machining H.T.A. materials more efficiently. ISO-TURN insert with 4 cutting edges for truncated radius. A configuration which facilitates heat transfer from the cutting area.
Rough Helical Interpolation
Range: Ø25-160 mm (Ø.985-6.3”)

MillSHRED
ROUND LINE
Milling cutters that can carry either round inserts with a serrated cutting edge or regular round inserts. The serrated insert has four indexing orientation options and minimize chamfering in long overhang interpolation, (Wellheads bottom face holes).

Precise Boring
ITSBORE
High accuracy in boring operations have a strong impact on the machining process strategy to be adopted on the production floor. The wide range of tools offered by ISCAR’s ITSBORE system brings the best solution for stiffness and precision in boring operations.
Valves, fittings and pumps are popular components in pressure control systems, providing the requested well security at heavy duty conditions for surface and subsea operations. The high strength of stainless steels, duplex and super duplex alloys assure long lasting pressure systems and are very common in the pressure control system field. Other exotic materials such as titanium, inconel, powder metals and forging are also well-known in this sector. ISCAR has a wide range of tooling and carbides for these materials. It is only the process of tooling selection that needs to be addressed, and this is where ISCAR’s experience has a great advantage over any other cutting tool supplier.

**Face Milling Insert with 16 Economical Cutting Corners**

Range: Ø40-315 mm (Ø1.57-12.40”)

Each insert has 16 cutting edges, either right- or left-hand. Maximum depth of cut is 5.5 mm (0.216”) if 16 cutting edges are required, or 13 mm (0.511”); in which case only 8 cutting edges can be used.

**Hole Making**

Range: Ø6-32.9 mm (Ø.236-1.295”)

The new DCN drills feature cylindrical shanks, which enable clamping of the drill in hydraulic toolholders (most recommended) or in spring collets.

Oil and Gas Industries
**Milling**

Range: Ø3-25 mm (Ø0.118-.985”)

**SOLIDTHREAD**

SOLIDTHREAD milling cutters are available in addition to thread milling cutters, with indexable thread milling inserts for any thread profile.

**Hole Making**

Range: Ø61-80 mm (Ø2.40-3.15”)

**DR-TWIST INDEXABLE DRILL LINE**

The inserts are available with two chipformer types for low alloy steel, stainless steel and high temperature alloys for high speed drilling of cast iron and steel, used for the peripheral insert.

**MULTI-MASTER Endmills**

The innovative family of carbide interchangeable heads provides a large range of applications in milling including ball-nose, shouldering, slitting, chamfering, counter boring, etc.
Pressure Control Machining

Turning Tools for High Pressure Coolant

High temperature alloys generate a very high temperature as they are being cut. By effectively removing with JET HP LINE products, the heat from the cutting edge tool life is dramatically improved and the chips become less ductile and thus easier to break.

Ring Groove Tooling Face Trepansing

Specially designed to improve productivity output. Optimal engineering design is applied to cut down machining costs. Best option for BX, RX, R and similar API-style ring grooves.
Rampdown Milling Interpolation
Range: Ø16-125 mm (Ø.63-4.92”)

ISCAR’s H600 WXCU … HELIDO-FEEDMILL trigon double-sided, 6-edged insert combines HELIDO’s strength and FEEDMILL’s special geometry to facilitate milling at very high feed rates of up to 2 mm (0.078”)/tooth for high volume metal removal rate.

Fine Boring

The wide range of tools offered by ISCAR’s ITSBORE system brings the best solution for stiffness and precision in boring operations. BHE boring heads are capable of reaching up to 10µm [0.00004”] in diameter accuracy and are equipped with a graduated dial of 0.01 mm [0.0004”] circular vernier. BHF Fine Boring Heads, the most accurate tooling system in ITSBORE line, are capable of reaching high precision machining up to 2µ [0.0000078”] tolerance and high surface quality.
Frac Pump Machining Solutions

Hydraulic fracturing equipment used in oil and natural gas fields usually consists of a slurry blender, one or more high-pressure, high-volume fracturing pumps such as powerful triplex or quintuplex pumps, and monitoring units.

Associated equipment includes fracturing tanks, one or more units for storage and handling of proppant, high-pressure treating iron, a chemical additive unit, low-pressure flexible hoses, and many gauges and meters for flow rate, fluid density, and treating pressure. Fracturing equipment operates over a range of pressures and injection rates, and can reach up to 100 megapascals (15,000 pse) and 265 liters per second (9.4 cu ft/s) (100 barrels per minute).

Deep Hole Drilling System

ISCAR DEEP DRILL

Single Tube System: requires the use of dedicated machines.
STS - Single Tube System
Range: Ø14.51-Ø245.99mm (Ø.571-Ø9.68"), IT9

Double Tube System: Can be applied on standard machines.
DTS - Double Tube System
Range: Ø18.41-168.99mm (Ø.724-6.65") IT9-IT10

Brazed Drills
- For short production series
- Multiple tips for chip splitting
- For difficult-to-machine materials, high temperature alloys, hardened steel
- Risky application (low cost head)
- Recommended for use by an experienced operator

Indexable Drills
- For high volume production
- Wide chip gullet for better chip evacuation
- High accuracy
- Ceramic guide pads available upon request, for titanium and stainless steel

Trepampling Drills
- Requires less power than a solid drilling application
- Trepampling leaves a core that can be used for material analysis and production of other parts
- Hole tolerance is not as accurate as with solid drilling

Fully Effective Large Diameter

Range: Ø26-50 mm (Ø1.023-1.968"")

ISCAR’s new large diameter drill (X59) is a fully effective tool with high penetration rate for increased productivity.

The COMBICHAM combines the best of two worlds: peripheral economical 4-cornered inserts from the DR-TWIST line + a central SUMOCHAM drill head.
Frac Pump Machining Solutions

Slotting Cutter with Coolant Through
Range: Ø100-250 mm (Ø3.94-9.84”)

TANGSLOT
Front and Back Milling
(FST slotting cutters) ISCAR’s tangential slot milling cutters use cutting inserts with 4 cutting edges. They are suitable for high table feeds, resulting in increased productivity.

SPECIAL TAILORED

TANGSLIDE

HTP... Side Plungers for Efficient Plunge Milling
Range: Ø16-80 mm (Ø.63-6.00”)

TANGPLUNGE PLUNGING LINE
TANGPLUNGE HTP plungers carry tangentially clamped inserts on the frontal face of the tools, featuring high durability and excellent cutting performance. They all have coolant holes for efficient edge flushing and chip evacuation.

Tangential Extended Flute Shoulder Milling
Range: Ø20-125 mm (Ø1.00-4.00”)

HELITANG T490 LINE
HELITANG T490 is a family of milling tools that uses tangentially clamped inserts with four right-hand helical cutting edges. The T490 inserts are available in 8, 13 and 16 mm long cutting edges.

TANGPLUNGE

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TANGPLUNGE
The downstream segment of the oil and gas industry covers the refining and transformation of hydrocarbons into more valuable products such as fuels, lubricants and petrochemicals, including fertilizers, rubbers and polymers. Compressors, steam turbines, heavy duty gas turbines and reactors and steam condensers are widely used in the downstream sector and are present in refineries, oil rigs, LNG plants, etc. One of the most important pieces of equipment at these industrial sites, especially in the oil and gas industry, is the heat exchanger, that is designed to efficiently transfer heat. Despite their name, heat exchangers can actually be used for either heating or for cooling. In the oil and gas industry they are typically used for the purpose of cooling.
Downstream Sector

Heat Exchanger

Tube Sheets

Heat Exchanger
Heat Exchangers

Reaming Applications
High Productivity Indexable Carbide Heads
Range: Ø11.5-32 mm (Ø0.453-1.26”)

**BAYO T-REAM**
In comparison to the conventional method, this advanced solution allows for increasing the feeds dramatically. This feature is most advantageous in mass production industries. When large quantities of workpieces are involved, the savings in machining time, labor cost and productivity are greatly multiplied.

Fully Effective Core Drill
Range: Ø60 mm (2.36”) and up

**TREPAN DRILL**
- Fully effective tool which requires less power than solid drills
- Solid core left after drilling can be applied as a workpiece
- Standard double-ended, self clamped GRIP inserts

Slitting Applications
Double Groove-Mill System for Internal Slitting
Range: Ø15.5-24.5 mm (Ø0.61-1.00”)

**MULTI-MASTER INDEXABLE SOLID CARBIDE LINE**
- For internal slitting of small grooves
- Slitting widths are 3 mm (1/8”) at grooving depths of up to 0.5 mm (.02”)
- No deburring operation is needed, as no burr remains on grooved edge.
Fully Effective
Large Diameter Drill
Range: Ø26-50 mm (Ø1.023-1.968")

**COMBICHAM**

The COMBICHAM combines the best of two worlds:
Peripheral economical 4-cornered inserts from the DR-TWIST line + a central SUMOCHAM drill head. No pre-hole is needed up to 5XD drilling ratio.

Hole Making
Range: Ø6-32.9 mm (Ø.236-1.295")

**SUMOCHAM**

The DCN drills feature cylindrical shanks, which enable clamping of the drill in hydraulic toolholders (most recommended) or in spring collets. All drill bodies feature helical coolant holes.

Deep Hole Drilling System*
Range: Ø8-300 mm (Ø.315-11.8")

**ISCARDEEPDRILL**

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