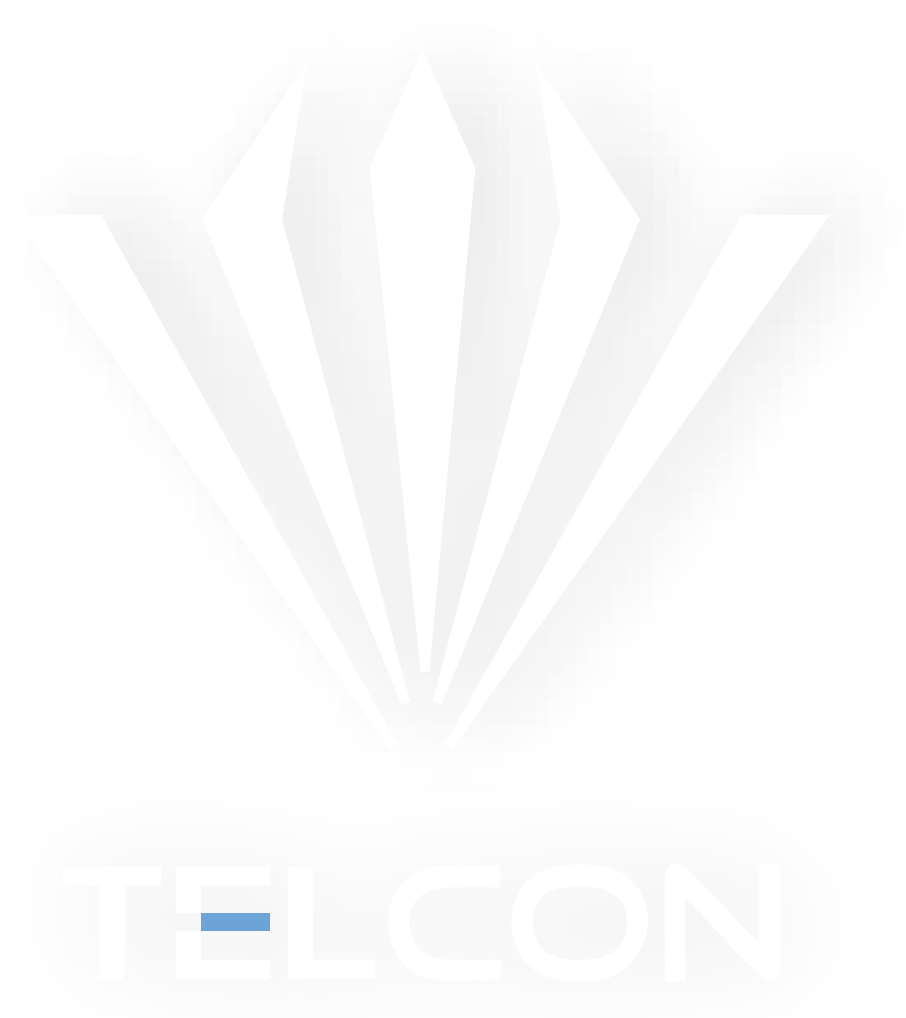

TELCON
DIAMOND CUTTING TOOLS
Spirit of Perfection
www.telconpcd.com



Diamond Cutting Tools

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TELCON is a world leading manufacturer of PCD and CVD diamond cutting tools for the machining of composite materials: CFRP and GFRP.
TELCON produces a wide range of tools used by many of the world's leaders in the field including Boeing, Airbus, Lockheed-Martin, Spirit, ATK, Embraer, Denel, ELBIT and IAI.

TELCON's tools include: PCD tipped Drills, CVD diamond drills, Carbide drills, PCD Countersinks, Carbide tipped Countersinks, PCD tipped End Mills and CVD diamond End Mills and Carbide End Mills, used worldwide by the aerospace industry, airframe assembly and CNC plants.
TELCON is located in a modern, 4000 square meter plant, with the most advanced grinding, EDM and laser machines and state of the art quality control equipment.

TELCON's vacuum brazing equipment is the most modern, sophisticated and controlled to ensure highest repeatability and reproducibility of brazing operation.

TELCON uses the highest quality PCD and carbide grades and world class CVD coatings. In addition to tools manufacturing, Telcon operating reconditioning services for PCD and carbide tools. TELCON personnel is a highly dedicated and devoted professional team with good blending of highly experienced and young energetic personnel leading the way to TELCON's success and future growth.

TELCON is ISO 9001, 2015 certified, adopting total quality management (TQM), all of TELCON's divisions relentlessly strive to develop new methods, improve efficiency, and manufacture innovative Diamond tools.

TELCON est l'un des principaux fabricants mondiaux d'outils coupants en diamant PCD et CVD destinés à l'usinage de matériaux composites CFRP et GFRP.
TELCON fabrique une large gamme d'outils utilisés par de nombreux leaders mondiaux du secteur, notamment Boeing, Airbus, Lockheed-Martin, Spirit, ATK, Embraer, Denel, ELBIT et IAI.
La large gamme d'outils de Telcon comprend, entre autres, des forêts à pointe PCD, en diamant CVD, en carbure de tungstène, des coniques en PCD, coniques en carbure de tungstène, des fraises en bout PCD, des fraises en diamant CVD et des fraises en carbure de tungstène, utilisés dans le monde entier par l'industrie aérospatiale, dans l'assemblage de cellules et dans nombreuses installations à commande numérique.
Le site Telcon comprend 4000 m2 d'usinage moderne, équipé de machines d'électroérosion, de meuleuses et à lasers, ainsi que des équipements de contrôle qualité, à la pointe de la technologie, Le matériel de brasage sous vide de Telcon est aussi moderne et sophistiqué, contrôlé pour assurer une répétabilité et une reproductibilité maximales du fonctionnement du brasage.
TELCON utilise des matériaux PCD carbure de tungstène de la plus haute qualité et des revêtements CVD de classe mondiale. En plus de la fabrication d'outils, Telcon propose des services de reconditionnement d'outils en PCD et en carbure.
L'équipe de professionnels de Telcon, jeune, dynamique, hautement expérimentée et extrêmement dévouée, est à la base du succès et de la croissance de Telcon.
TELCON est certifiée ISO 9001, 2015, adoptant la gestion de la qualité totale (TQM). Toutes les divisions de TELCON s'efforcent sans relâche de développer de nouvelles méthodes, d'améliorer leur efficacité et de fabriquer des outils diamants innovants et performants.

TELCON 是世界领先的PCD和CVD金刚石切削刀具制造商，产品主要用于加工复合材料：CFRP 和 GFRP。TELCON 刀具被全球航空航天工业，飞机装配厂及数控工厂广泛使用，客户群涵盖世界航空领域的各大巨头，如波音，空客，洛克希德-马丁 Spirit，ATK，巴西航空工业公司，DENEL，ELBIT，中航工业及以色列航空工业公司等。TELCON 生产品种齐全的各类刀具，包括：镶 PCD 钻头，CVD 金刚石涂层钻头，硬质合金钻头，镶 PCD 锪窝钻，镶硬质合金锪窝钻，镶 PCD 立铣刀 CVD 金刚石涂层立铣刀和硬质合金立铣刀等。

TELCON 拥有一个 4000 平方米的现代化工厂，配有最先进的磨床，电火花设备，激光设备，以及最精密等级的质量控制设备。
TELCON 的真空钎焊设备是最现代化，最尖端的控制设备，可确保钎焊操作的最高可重复性和再现性。
TELCON 采用最高质量等级的PCD和硬质合金以及世界一流的 CVD 涂层。除工具制造外，TELCON 还为PCD和硬质合金刀具提供修磨翻新服务。

TELCON 拥有一支高度敬业，全身心投入的专业团队由经验丰富，年轻有活力的人才组成，他们引领着 TELCON 的成功和未来的发展。

TELCON 通过了 ISO 9001：2015 认证，采用全面质量管理（TQM），
TELCON 的所有部门都在不懈地努力开发新方法，提高效率，并制造创新的金刚石工具。

TELCON ist ein weltweit führender Hersteller von PKD- und CVD-Diamantschneidwerkzeugen für die Bearbeitung von Verbundwerkstoffen: CFK und GFK. TELCON produziert eine breite Palette von Werkzeugen, die von vielen der weltweit führenden Unternehmen in diesem Bereich eingesetzt werden, darunter Boeing, Airbus, Lockheed-Martin, Spirit, ATK, Embraer, Denel, ELBIT und IAI. Zu den Werkzeugen von Telcon gehören: PKD-Bohrer, CVD-Diamantbohrer, Hartmetallbohrer, PKD-Senker, Hartmetall-Senker, PKD-Schaftfräser und CVD-Diamant-Schaftfräser und Hartmetall-Schaftfräser, die weltweit in der Luft- und Raumfahrtindustrie, in Flugzeugzellen und in CNC-Werken eingesetzt werden.
TELCON befindet sich in einem modernen, 4000 Quadratmeter großen Werk mit modernsten Schleif-, Erodier- und Lasermaschinen und modernsten Geräten zur Qualitätskontrolle. Die Vakuum-Lötanlagen von TELCON sind modern, ausgereift und kontrolliert, um höchste Wiederholgenauigkeit und Reproduzierbarkeit des Lötvorgangs zu gewährleisten. TELCON verwendet die hochwertigsten PKD- und Hartmetallsorten sowie erstklassige CVD-Beschichtungen. Neben dem Werkzeugbau betreibt Telcon auch Aufbereitungsdienstleistungen für PKD- und Hartmetallwerkzeuge.
Das TELCON-Personal ist ein hoch engagiertes und engagiertes professionelles Team mit einer guten Mischung aus erfahrenen und jungen Mitarbeitern, die den Weg für den Erfolg und das zukünftige Wachstum von TELCON weisen.
TELCON ist nach ISO 9001, 2015 zertifiziert und übernimmt das Total Quality Management (TQM). Alle Unternehmensbereiche von TELCON sind unermüdlich bestrebt, neue Methoden zu entwickeln, die Effizienz zu verbessern und innovative Diamantwerkzeuge herzustellen.

"TELCON es un fabricante mundial de herramientas de corte de diamante PCD y CVD para el mecanizado de materiales compuestos: CFRP y GFRP. TELCON produce una amplia gama de herramientas utilizadas por muchas de las empresas líderes en el rubro, como Boeing, Airbus, Lockheed-Martin, Spirit, ATK, Embraer, Denel, ELBIT e IAI. Las herramientas de Telcon incluyen: Fresas con punta PCD, Fresas con diamante CVD, Fresas con carburo, Fresas (forma cónica) de PCD, Fresas (forma cónica) con punta de carburo, Fresas con punta PCD, Fresas con diamante CVD y Fresas con carburo, las cuales son utilizadas en todo el mundo por las industrias aeroespacial, ensamblaje de fuselaje y plantas CNC.

TELCON se encuentra en una moderna planta de 4000 metros cuadrados, con las máquinas más avanzadas de rectificado, EDM y láser y el más moderno equipo de control de calidad. El equipo de soldadura fuerte al vacío de TELCON es el más novedoso, sofisticado y controlado para garantizar la máxima repetibilidad y reproducibilidad de la operación de soldadura fuerte.

TELCON utiliza la más alta calidad de PCD y carburo y los revestimientos CVD de clase mundial. Además de la fabricación de herramientas, TELCON opera los servicios de reacondicionamiento para PCD y herramientas de carburo.

El personal de TELCON es un equipo profesional altamente capacitado y dedicado que cuenta con una combinación exacta de energía joven e innovadora y gran experiencia que marca el camino hacia el éxito y el crecimiento futuro de TELCON.

TELCON tiene la certificación ISO 9001, 2015, adopta el sistema de gestión de calidad total (TQM), todas las divisiones de TELCON se esfuerzan incansablemente por desarrollar nuevas técnicas, mejorar la eficiencia y fabricar innovadoras herramientas de diamante."

Компания TELCON – ведущий мировой производитель режущего инструмента с PCD (поликристаллический алмаз) элементами и CVD алмазным покрытием для обработки композитных материалов: CFRP и GFRP. Широкий ассортимент предлагаемого инструмента используется компаниями-лидирами в отрасли, включая Boeing, Airbus, Lockheed-Martin, Spirit, ATK, Embraer, Denel, ELBIT и IAI. Продукция компании включает в себя: свёрла с напайными пластинами PCD, свёрла с CVD алмазным покрытием, твердосплавные свёрла, зенкеры с напайными пластинами PCD, зенкеры с напайными твердосплавными пластинами, концевые фрезы с напайными пластинами PCD, концевые фрезы с CVD алмазным покрытием, твердосплавные концевые фрезы, используемые в аэрокосмической отрасли по всему миру.
Производство компании TELCON расположено на современном заводе площадью в 4000 м2 и оснащено самым современным шлифовальным, электроэрозионным и лазерным оборудованием, а также современной контрольно-измерительной техникой. Передовое вакуумное оборудование для пайки обеспечивает максимальную повторяемость и воспроизводимость процесса пайки.
TELCON использует высококачественные пластины PCD, а так же твёрдые сплавы и CVD покрытия мирового уровня. Помимо производства, компания предоставляет услуги по восстановлению твердосплавного инструмента, а также режущих элементов из PCD.
Персонал компании TELCON – высококвали фицированная и преданная своему делу команда, которая сочетает в себе опыт и молодость, ведущие к успеху и последующему росту компании.
Продукция компании TELCON сертифицирована по стандарту ISO 9001:2015 и полностью интегрирована в систему управления качеством (TQM). Все подразделения компании неустанно стремятся разрабатывать новые методы, повышать эффективность и производить инновационный алмазный т.

COMPOSITE MATERIALS

Composite materials are made from two or more material components with different physical or chemical properties that, when combined, produce a material with different (better) characteristics than each of the individual components.

Composite materials are in use in various applications in Aerospace, Automotive, Energy, Sports, Construction and more.

The fundamental advantage of composite materials is higher strength to weight ratio, which brings added value in the aforementioned applications.

In most cases, composite materials are constructed from two main materials: fibers of strong material, such as Glass or Carbon and a polymer matrix material, such as epoxy, which bonds the fibers together in a certain shape.

The table below summarizes the majority of composite material options:

Fibers	Polymer Matrix (bond)
Carbon fiber	Epoxy
Glass fibers	Phenolic
Ceramic fibers	Polyimide
Polymer fibers (Kevlar, Polyethylene)	Poly-ether -ether-ketone (PEEK)
Tungsten fibers	

The two most advanced composite materials in use are Carbon Fibers, also called CFRP (Carbon Fiber Reinforced Polymer) and Glass fibers, also called GFRP (Carbon Fiber Reinforced Polymer) .

Mass production of glass strands was accidentally discovered in 1932 when Games Slayter, a researcher at Owens-Illinois, directed a jet of compressed air at a stream of molten glass and produced fibers.

It wasn't until the late 1950's that high tensile strength carbon fibers were discovered. Rayon became the first precursor used to create these modern fibers. Ultimately, it was replaced by more effective materials such as polyacrylonitrile (PAN).

Between the two, GFRP is lighter and stronger, however, more expensive, therefore in use mostly in Aerospace and in luxury and sports cars and professional sport equipment.

Manufacturing process of composite materials involves three main technologies; the manufacturing of the fiber, the manufacturing of the polymers and the manufacturing of the combined composite material itself.

The process for making carbon fibers, which is part chemical and part mechanical involves the use of a precursor (About 90% of the carbon fibers produced are made from polyacrylonitrile, PAN) which is drawn into long strands or fibers and then heated to a very high temperature without allowing it to come in contact with oxygen. Without oxygen, the fiber cannot burn. Instead, the high temperature causes the atoms in the fiber to vibrate violently until most of the non-carbon atoms are expelled. This process is called carbonization and leaves a fiber composed of long, tightly interlocked chains of carbon atoms with only a few non-carbon atoms remaining.

Fiber reinforced composite materials can be divided into two main categories normally referred to as short fiber-reinforced materials and continuous fiber-reinforced materials.

Continuous reinforced materials will often constitute a layered or laminated structure. The woven and continuous fiber styles are typically available in a variety of forms, being pre-impregnated with the given matrix (resin), dry, uni-directional tapes of various widths, plain weave, harness satins, braided, and stitched.

The short and long fibers are typically employed in compression molding and sheet molding operations. These come in the form of flakes, chips, and random mate (which can also be made from a continuous fiber laid in random fashion until the desired thickness of the ply / laminate is achieved).

In the next article we will discuss different manufacturing methods of composite materials, their pros and cons and their use in the industry.

DIAMOND – NATURAL OR SYNTHETIC ?

The main difference between real diamonds and synthetic diamonds is that, real diamonds are mined and synthetic diamonds are created in the laboratory.
Natural Diamonds are formed inside the earth mantle over millions of years at high temperatures and depth. Diamond is made of carbon and has a crystal structure.
Synthetic diamonds also known as "lab grown", are not mined but are created in the laboratory. These diamonds are made from carbon and even have the same physical properties and chemical composition as natural diamonds. They are made by HPHT (High-Pressure High-temperature) or through commonly used CVD (Chemical Vapor deposition). They are designed to look like real diamonds and have the same characteristics.

Synthetic diamonds are lower priced compared to natural diamonds and therefore are used in many industrial applications.
One of these applications is PCD – Poly Crystalline Diamond. PCD is a synthetic diamond produced by sintering together selected diamond particles with a metal matrix at high temperature and high pressure.
The polycrystalline form is 'isotropic' – exhibiting uniform properties in all directions. The varying orientation of the constituent micron-sized synthetic diamond grains also provides a greater resistance to cleavage and PCD is therefore, a stronger material. PCD can be machined in electric-discharge machining (EDM) process due to conductive metal content, mostly cobalt. Still, diamond content of the PCD is 90-95%.

In Telcon, we machine most of the PCD tools in Erosion (EDM) technology, which is applied in wire-cut EDM and disc shape EDM. Among our diamond cutting tools solutions, you can find: diamond drill bits, diamond countersinks and diamond end-mills. In each of these tool categories, you can find both PCD and CVD solutions. For example, you may find PCD drills and CVD drills, PCD end-mills and CVD end-mills for various applications.

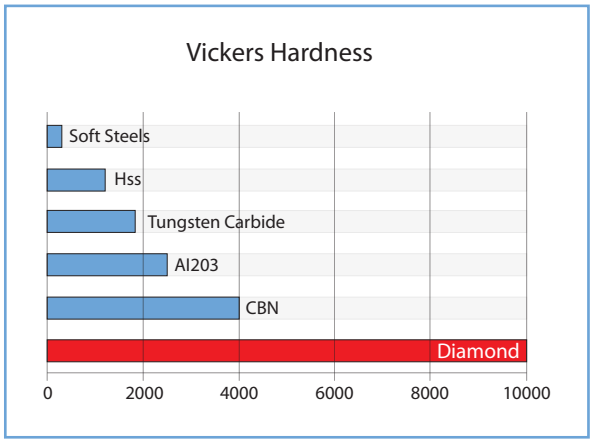
DIAMOND WHY DO WE USE IT ?

Diamond is a solid form of the element carbon with its atoms arranged in a crystal structure called diamond cubic.

Typically, natural diamonds age for between 1 billion and 3.5 billion years. Most were formed at depths between 150 and 250 kilometers in the Earth's mantle. Some have come from depths of as much as 800 kilometers under high pressure and temperatures, where carbon-containing fluids dissolved minerals and replaced them with diamonds. Much more recently (tens to hundreds of million years ago), they were carried to the surface in volcanic eruptions and deposited in igneous rocks known as kimberlites.

Diamonds have the highest hardness and thermal conductivity of any natural material.

See the diagram below which emphasizes the level of hardness of diamond in comparison to other materials.
The material with the next level of hardness is CBN which is less than half as hard as the Diamond.



Hardness is a fundamental property of a material to resist a force applied causing it to deform. Another interpretation of the diamond hardness would be higher wear resistance. It can be easily understood that when diamond is in abrasive contact with another material, the diamond would remove much more stock from the other material, than would be removed from the diamond itself.
Clearly, due to higher hardness, diamond applications can be seen in the cutting tools industry. Diamonds are used in grinding wheels to grind hard metals, such as tungsten carbide or to cut and shape granite. Diamonds are being used as a cutting tool edge for the machining of non-ferrous abrasive materials, such as composite materials, hard ceramics, high silicone aluminum etc. Diamonds are also being used as a cutting edge in the road-header on excavating machines for roads, tunnels and mining.

The second advantage of the diamond as a cutting tool material is the thermal conductivity.
During machining, the cutting forces generate heat. The heat is distributed among 3 elements: the workpiece, the cutting tool and the removed material chips.
The high thermal conductivity of the diamond will ensure that large amounts of heat energy is dissipated in the tool itself and less to the workpiece. This protects the workpiece from thermal shock or deformation; this is mandatory, for instance, when machining carbon fiber reinforced plastic (CFRP). A higher heat level in the material might cause melting of the resin material while deteriorating the composite material's mechanical properties.

Telcon has been manufacturing in-house cutting tools for more than 35 years and gained vast experience and expertise in the manufacture of Diamond PCD tools and solutions for various applications in the machining of composite materials. All cutting tool solutions (PCD drills, CVD drills, PCD end mills and CVD routers or PCD countersinks) are high quality and high performance, providing long tool life with non-delamination and non-bur issues.

PCD

PCD (Poly Crystalline Diamond) is a synthetic diamond made of sintered diamond powder and other metals. TELCON uses the finest PCD materials for its PCD drills, Countersinks and End-Mills in the form of Wafer segments and Full-Nib segments, which are brazed in vacuum brazing technology to a body, made of tungsten carbide or treated steel. Different PCD substrates are chosen according to specific tool applications.

Tools are processed in hybrid erosion-grinding CNC centers to their final geometry.

Micro PCD tools

Micro PCD tools are still rare in the cutting tools market due to difficulty in achieving good results in the Erosion process. TELCON has acquired a new technology to manufacture micro PCD tools, allowing the achievement of superb surface finish and corner sharpness, in diameters of 1.0mm and under, for the use in machining hard materials in the dental, electronics and D&M industries.

Vein

PCD (Poly Crystalline Diamond) is a synthetic diamond made of sintered diamond powder and other metals. In the Vein technology, the PCD is sintered to the carbide body during its manufacturing process.

TELCON uses for its Vein drills the best in class PCD Vein sintered nibs allowing the achievement of the highest wear resistance and longer tool life.

CVD Diamond

CVD (Chemical Vapor Deposition) coating is an industry standard coating process of cutting tools. CVD Diamond, however, is a more specific and complex coating in which diamond Nano particles are grown on the tool substrate to have few microns layer thickness of diamond coating. For best results, specific carbide substrates (grades) should be used. TELCON uses the best in class tungsten carbide grade and CVD diamond coating on its drills and End-Mills, leading to excellent tool life workpiece quality.

Abrasives

Abrasive tools are a variety of Diamond Vacuum plated or Electro plated tool geometries for cutting, milling and grinding of composite materials and ceramics. TELCON's diamond abrasive tools, offer high grinding efficiency and low grinding forces, in order to avoid burning and cracks on the workpiece surface and to provide high wear resistance, leading to longer tool life.

PCD DIAMOND DRILLS

Telcon Diamond manufactures all cutting tool solutions for machining of composite materials. One of the successful series of products is the Diamond drill bit, known as PCD Drill. With and without coolant thru holes, these drills have added flexibility with improved geometry and can drill a wide range of composite materials: CFRP & CFRP/Stack materials. These drills are used also in the automotive industry – Aluminum with high Silicon applications. Telcon's Diamond drills , made from superior PCD diamond grades, are available in 4 and 8 facets and can also be made to print. Standard sizes begin from 2mm (.08"). Additional dimensions are available on request. All PCD Drills can be reconditioned several times. Telcon's PCD drills perform successfully and continuously at major aerospace customers in a variety of different applications. Ask us for more information on Diamond drills or Diamond cutting tools.

CVD DIAMOND DRILLS

Telcon Diamond manufactures all cutting tool solutions for machining of composite materials. One of the high performance series added recently to Telcon's diamond drills are Telcon's CVD drills.
A combination of high quality carbide grade with superior geometry design and world class CVD coating enables a competitive advantage and cost effectiveness significantly superior to carbide drills and even some PCD drills in the market. The unique design of the CVD drills allows higher tool life, as much 1000 holes and more, without delamination.
Cost per hole for Telcon's CVD drills is proved to be 0.1$/hole and less. These drills can be used on all types of composite materials, including unidirectional and bidirectional fiber materials, CFRP and GFRP.
Standard sizes begin from 3mm (.12"). Additional dimensions are available on request.

CSK DIAMOND DRILLS

Telcon Diamond manufactures all aerospace tools solutions for machining of composite materials. Drilling and countersinking are common practices in composite materials in CNC and airframe assembly lines.
One of Telcon's Diamond drill bit series is Drill/Countersinks which allows both drilling and countersinking to be made in one single manufacturing operation, while reducing manufacturing costs, tool costs and improving accuracy. Telcon's Drill/CSK are available in 3 configurations: PCD drill/PCD countersink, Carbide Drill/PCD countersink and CVD Drill/Countersink. The PCD Drill/CSK can be with either a wafer or Full-nib PCD configuration. This series of tools has no standard dimension and are thus primarily produced to print, while drill diameter, drill flute length, CSK diameter and CSK angle change. All dimensions can be done, including tools with a through coolant option. All drills/countersinks can be reconditioned several times.

TELCON

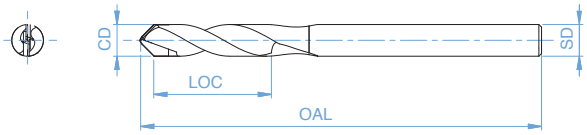
DIAMOND CUTTING TOOLS

The Next Tools Generation

PCD & CVD Drills

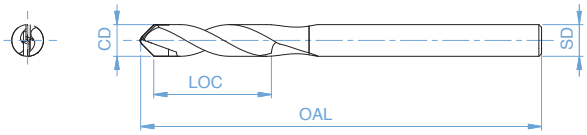
- PCD Wafer Drill
- PCD FullNib Drill-HELICON
- CVD Drill CVCON
- PCD Drill / CSK
- CVD Drill / CSK
- PCD CSK / Carbide point
- PCD Vein Drill
- Manual drills

PCD Wafer Drill - *Inches*



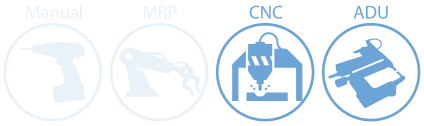
Cutting Diameter (+0.006)	Shank Diameter (h6)	LOC (+03)	OAL (+06)	Catalog Number
0.165	1/4	1.125	2.75	TSDR165250I
0.191	1/4	1.125	2.75	TSDR191250I
0.251	5/16	1.25	3	TSDR251313I
0.3125	5/16	1.25	3	TSDR313313I
0.375	3/8	1.5	3.5	TSDR375375I
0.4375	1/2	1.75	3.5	TSDR438500I
0.500	1/2	2	4	TSDR500500I

PCD Wafer Drill - *Milimeters*

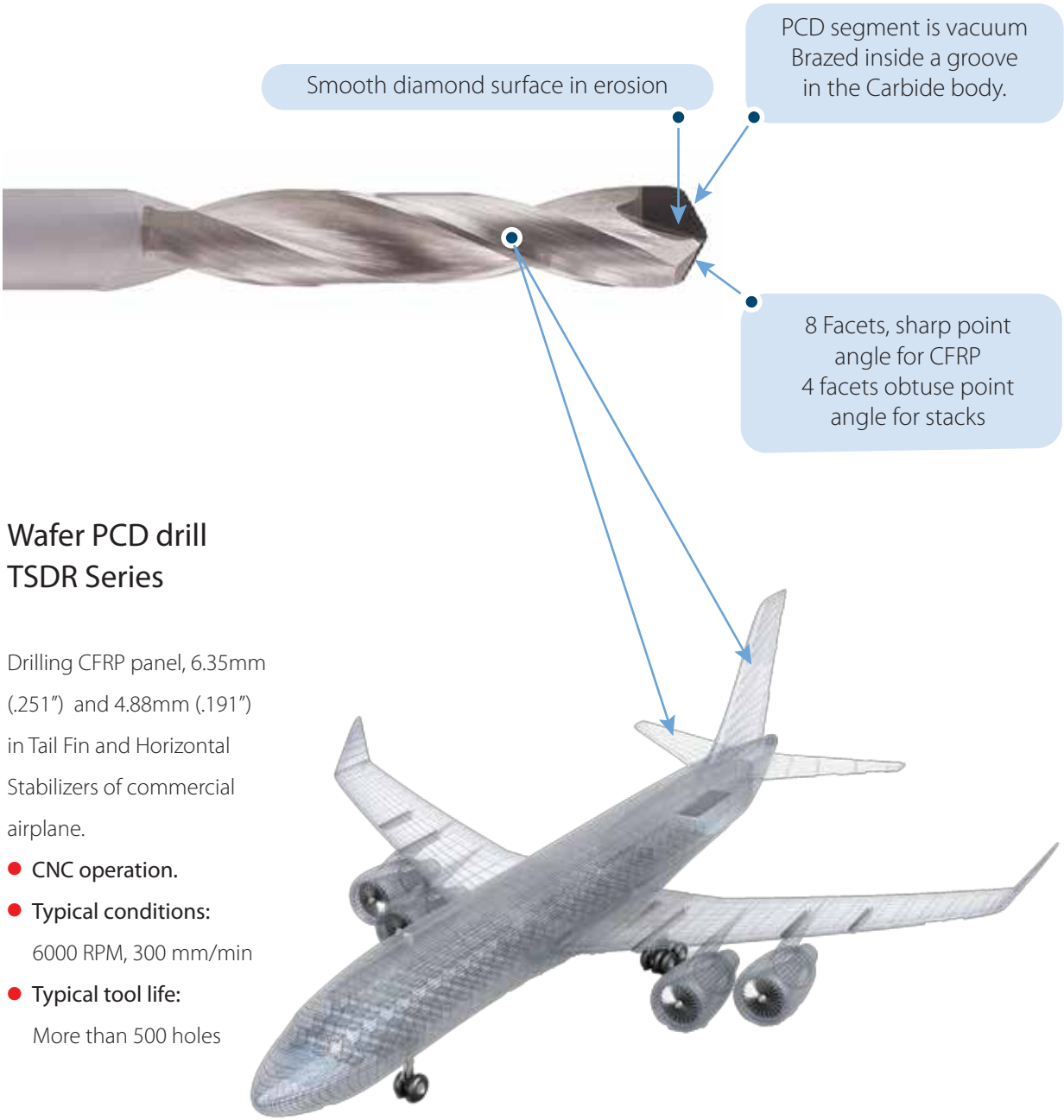


Cutting Diameter (+0.015)	Shank Diameter (h6)	LOC (+0.8)	OAL (+1.5)	Catalog Number
4.19	6.00	28	70	TSDR042006M
4.85	6.00	28	70	TSDR049006M
6.375	8.00	32	75	TSDR064008M
7.938	8.00	32	75	TSDR079008M
10.00	10.00	40	84	TSDR100010M
12.00	12.00	45	89	TSDR120012M

PCD Wafer Drill



- Most popular PCD drill for CFRP and Stacks
- Can be manufactured from 5mm to 32mm
- Reconditionable multiple times
- CNC and ADU usage

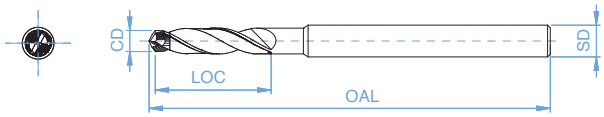


Wafer PCD drill
TSDR Series

Drilling CFRP panel, 6.35mm (.251") and 4.88mm (.191") in Tail Fin and Horizontal Stabilizers of commercial airplane.

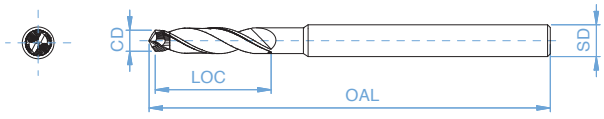
- **CNC operation.**
- **Typical conditions:**
  6000 RPM, 300 mm/min
- **Typical tool life:**
  More than 500 holes

PCD Fullnib Drill-HELICON - *Inches*



Cutting Diameter (+0.006)	Shank Diameter (h6)	LOC (+03)	OAL (+06)	Catalog Number
0.1299	3/16	1.0	2.75	FNDR130188I
0.165	1/4	1.125	2.75	FNDR165250I
0.191	1/4	1.125	2.75	FNDR191250I
0.251	5/16	1.25	3	FNDR251313I

PCD Fullnib Drill-HELICON - *Milimeters*

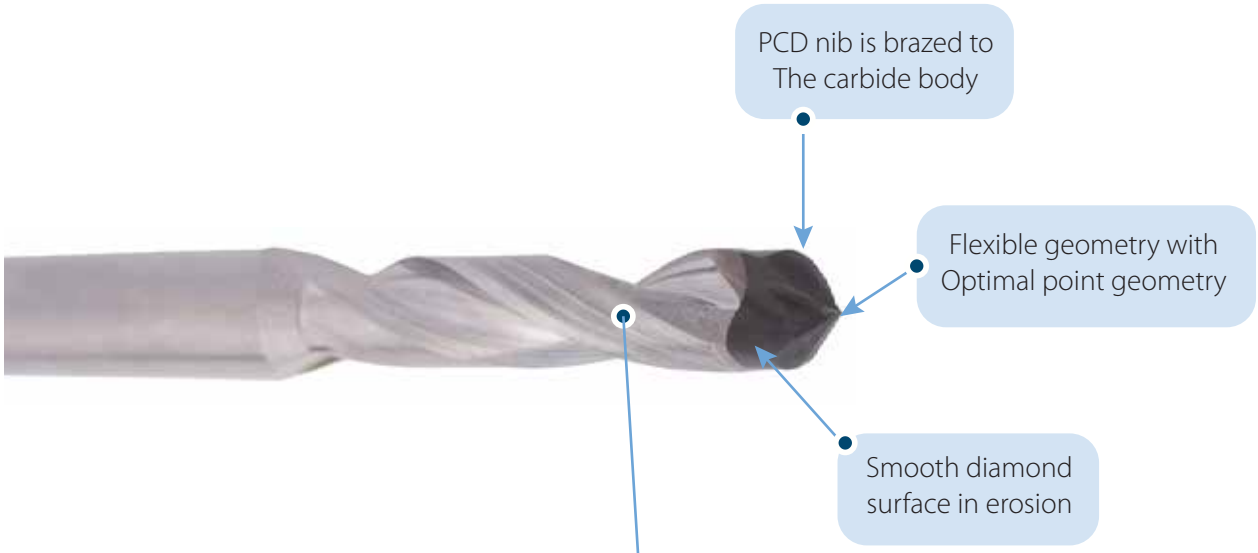


Cutting Diameter (+0.015)	Shank Diameter (h6)	LOC (+0.8)	OAL (+1.5)	Catalog Number
3.3	4.00	25	70	FNDR033004M
4.19	6.00	28	70	FNDR042006M
4.85	6.00	28	70	FNDR049006M
6.375	8.00	32	76	FNDR064008M

PCD FullNib Drill-HELICON

Manual MRP CNC ADU

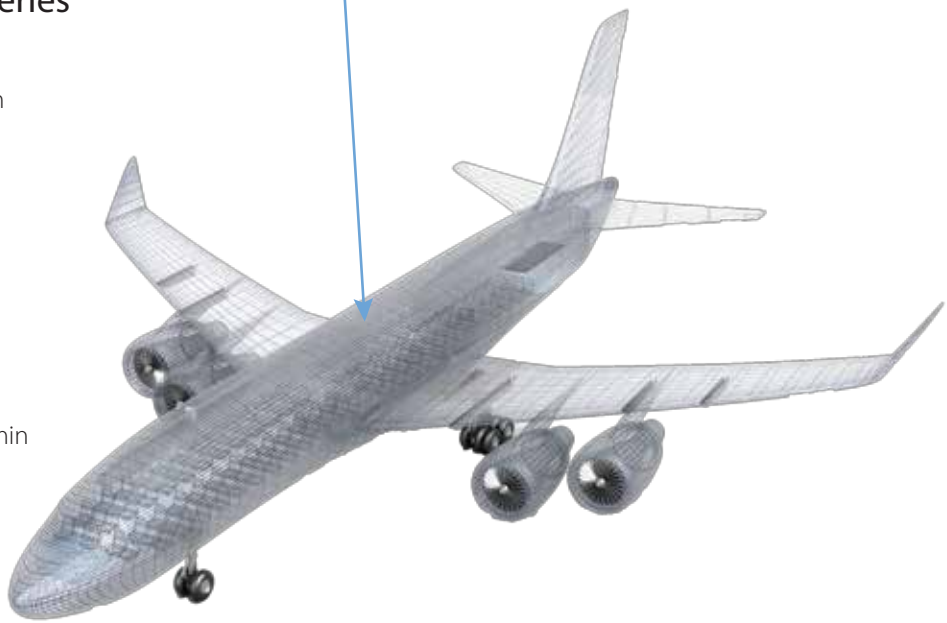
- Best PCD drill for CFRP in small diameters.
- Reconditionable multiple times.
- Can be manufactured from 2mm to 8mm.
- CNC usage



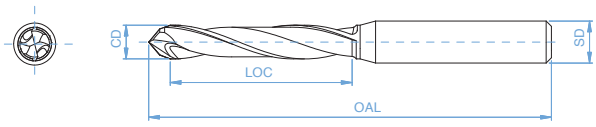
PCD FullNib drill, HELICON, FNDR Series

Drilling pilot holes, 3.3mm (.129") and 2.5mm (.098") to be used in assembly Of multiple CFRP parts of commercial airplane.

- CNC operation.
- Typical conditions:
  10,000 RPM, 500 mm/min
- Typical tool life:
  more than 5000 holes.

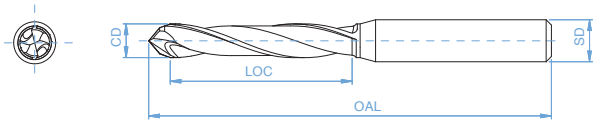


CVD Drill CVCON - *Inches*



Cutting Diameter (+0.006)	Shank Diameter (h6)	LOC (+03)	OAL (+06)	Catalog Number
0.1299	3/16	1.0	2.75	SCDR130188CVI
0.165	1/4	1.125	2.75	SCDR165250CVI
0.191	1/4	1.125	2.75	SCDR191250CVI
0.251	5/16	1.25	3	SCDR251313CVI
0.3125	3/8	1.25	3	SCDR313375CVI

CVD Drill CVCON - *Milimeters*

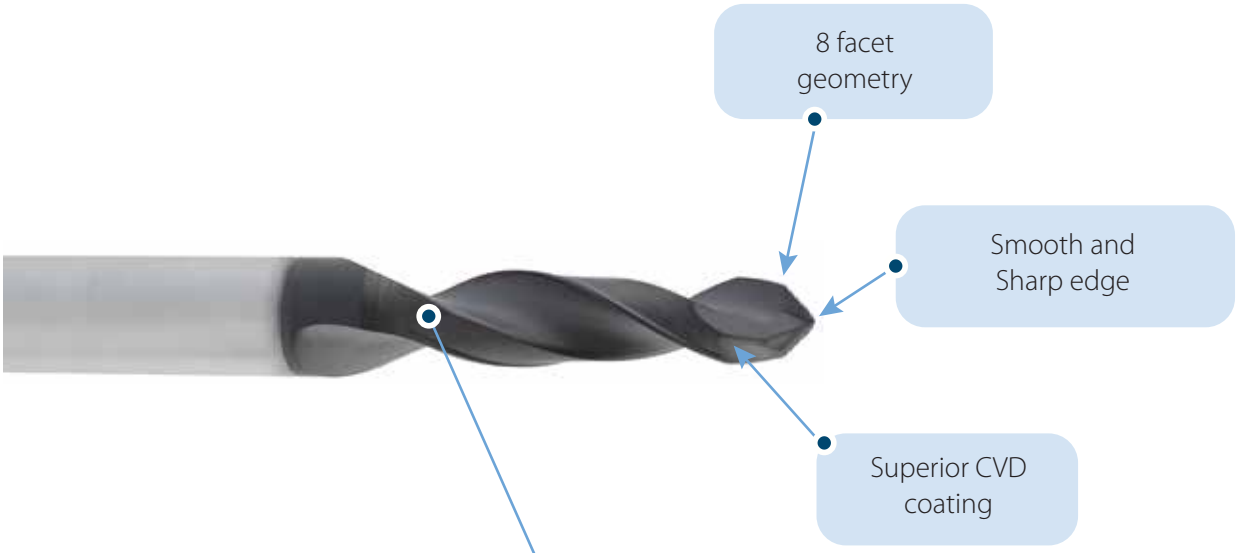


Cutting Diameter (+0.015)	Shank Diameter (h6)	LOC (+0.8)	OAL (+1.5)	Catalog Number
3.3	4.00	25	70	SCDR033004CVM
4.19	6.00	28	70	SCDR042006CVM
4.85	6.00	28	70	SCDR049006CVM
6.375	8.00	32	76	SCDR064008CVM
7.938	8.00	32	76	SCDR079008CVM

CVD Drill CVCON

Manual MRP CNC ADU

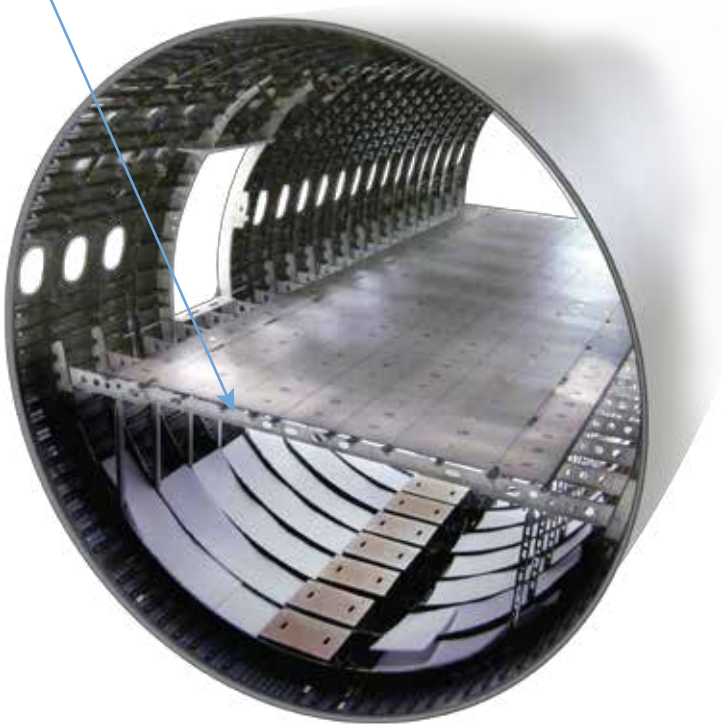
- Best cost/hole for all CFRP materials
- Specifically designed to eliminate all delamination issues
- CNC and ADU usage



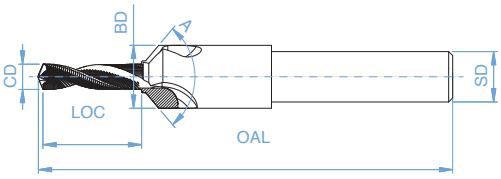
CVD drill, CVCON, SCDR Series

Drilling 6.39mm (.251") and 4.88mm (.191") In **I**, **C** and **J** Beams of commercial airplane.

- CFRP thickness of 4-7 mm.
- CNC operation
- Typical conditions:
  5,000 RPM, 300 mm/min (12 IPM)
- Typical tool life:
  more than 1500 holes



PCD Drill / CSK - *Inches*

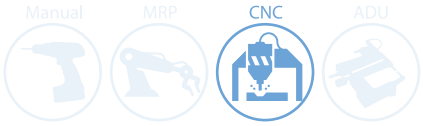


Ask us for other Dimensions

Cutting Diameter (+0.006)	Shank Diameter (h6)	Body Diameter (+/-.01)	CSK Angel	Catalog Number
0.165	1/4	0.375	100/130	TSDK165250I
0.191	3/8	0.500	100/130	TSDK191375I
0.251	5/16	0.625	100/130	TSDK251313I
0.3125	5/16	0.625	100/130	TSDK313313I

● LOC & OAL according request

PCD Drill / CSK

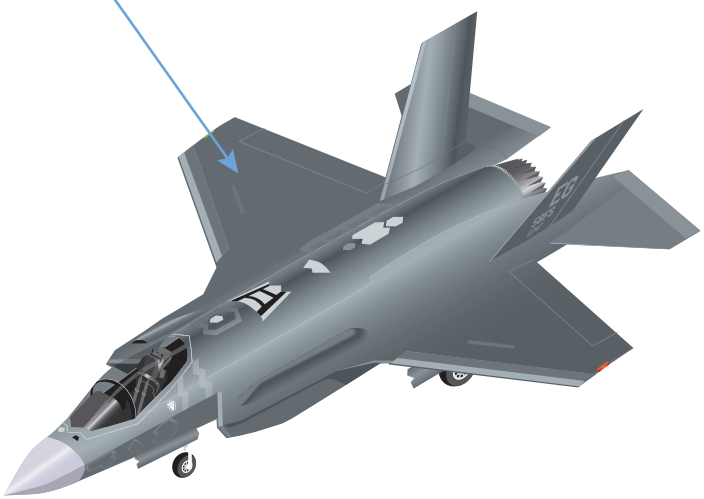


- Economical solution to have two operations in one shot
- Flute length and overall length acc. Request
- Reconditionable up to 5 time!
- CNC usage

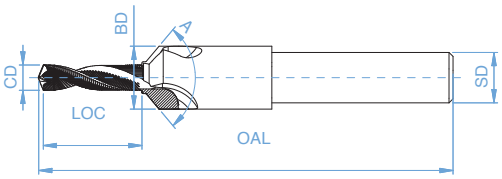
PCD drill/CSK, TSDK Series.

Drilling 4.88mm (.191") in wing skins stacks (CFRP/Al) of a jetfighter.

- **Total CFRP/Al** thickness of 12.7mm (1/2").
- **CNC operation.**
- **Typical conditions:** 8,000 RPM, 500 mm/min
- **Typical tool life:** more than 800 holes



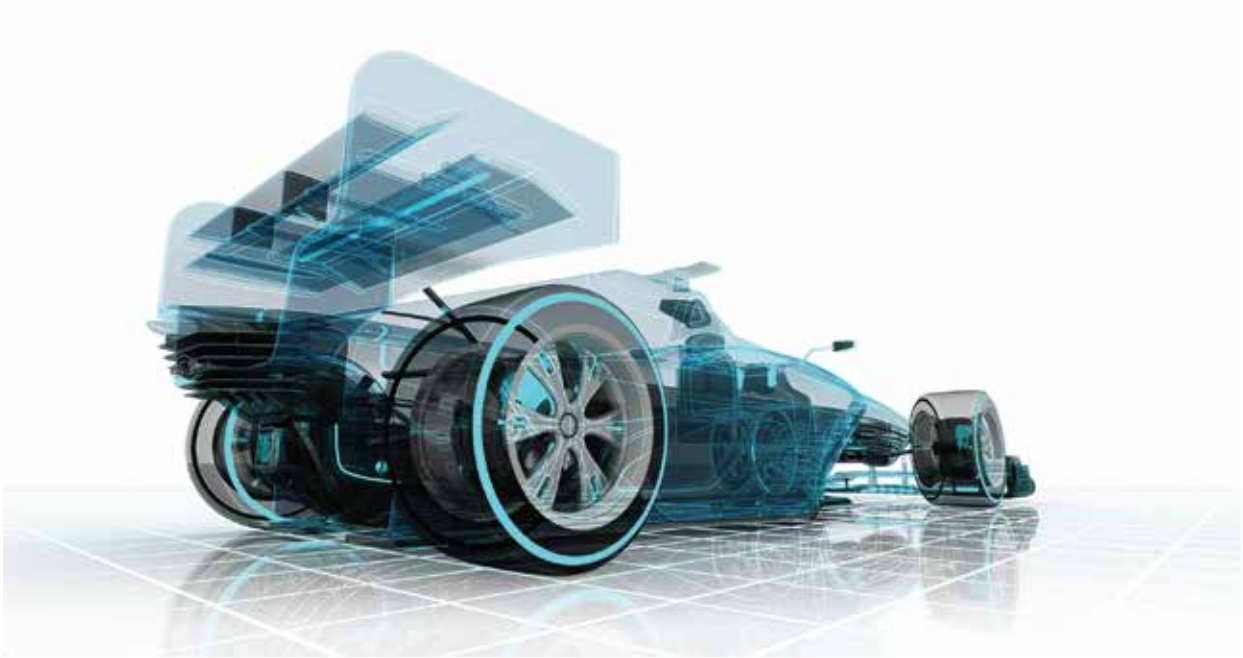
Carbide Drill/ PCD CSK - *Inches*



Ask us for other Dimensions

Cutting Diameter (+0.006)	Shank Diameter (h6)	Body Diameter (+/-.01)	CSK Angel	Catalog Number
0.165	1/4	0.375	100/130	WSDK165250I
0.191	3/8	0.500	100/130	WSDK191375I
0.251	5/16	0.625	100/130	WSDK251313I
0.3125	5/16	0.625	100/130	WSDK313313I

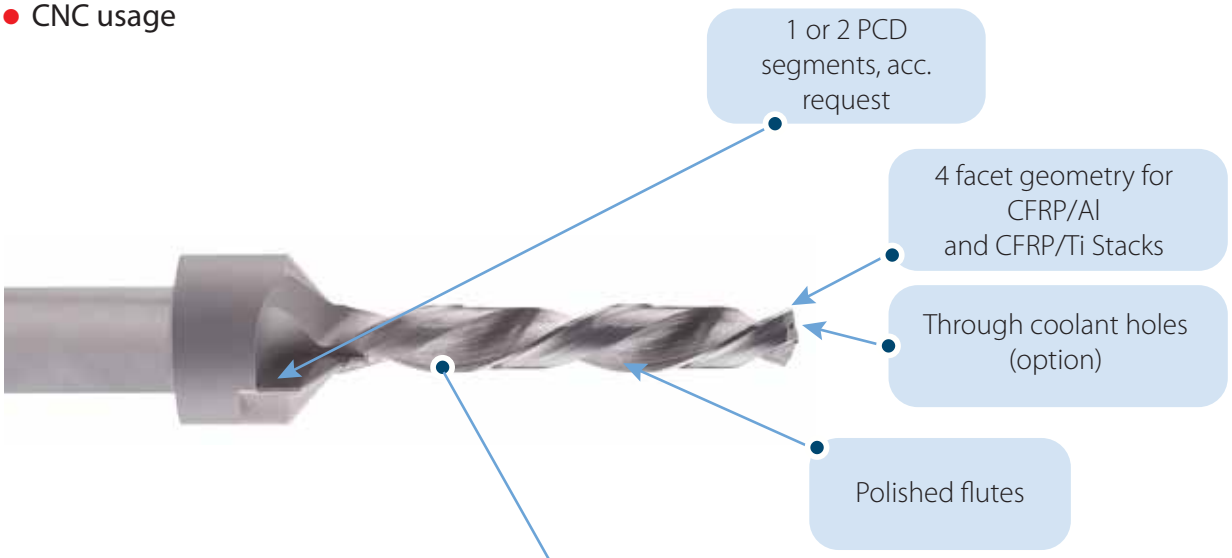
● LOC & OAL according request



PCD Drill / CSK

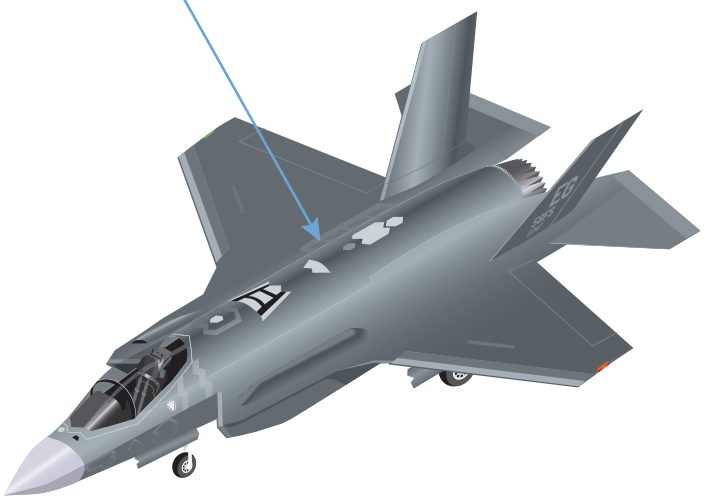
Manual MRP CNC ADU

- Economical solution to have two operations in one shot
- Flute length and overall length acc. Request
- Reconditionable up to 5 time!
- CNC usage



PCD drill/CSK, WSDK Series.

Drilling 4.88mm (.191") in composite parts CFRP/Al and CFRP/Ti of a jetfighter.

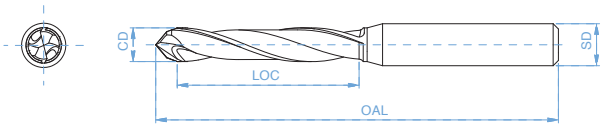


- CNC operation.
- Typical conditions:

  6,000 RPM, 400 mm/min @ CFRP/Al

  2500 RPM, 100 mm/min @ CFRP/Ti

CVD Drill/CSK - *Inches*

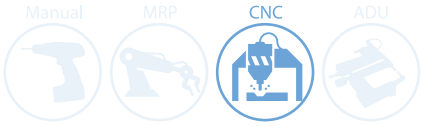


Ask us for other Dimensions

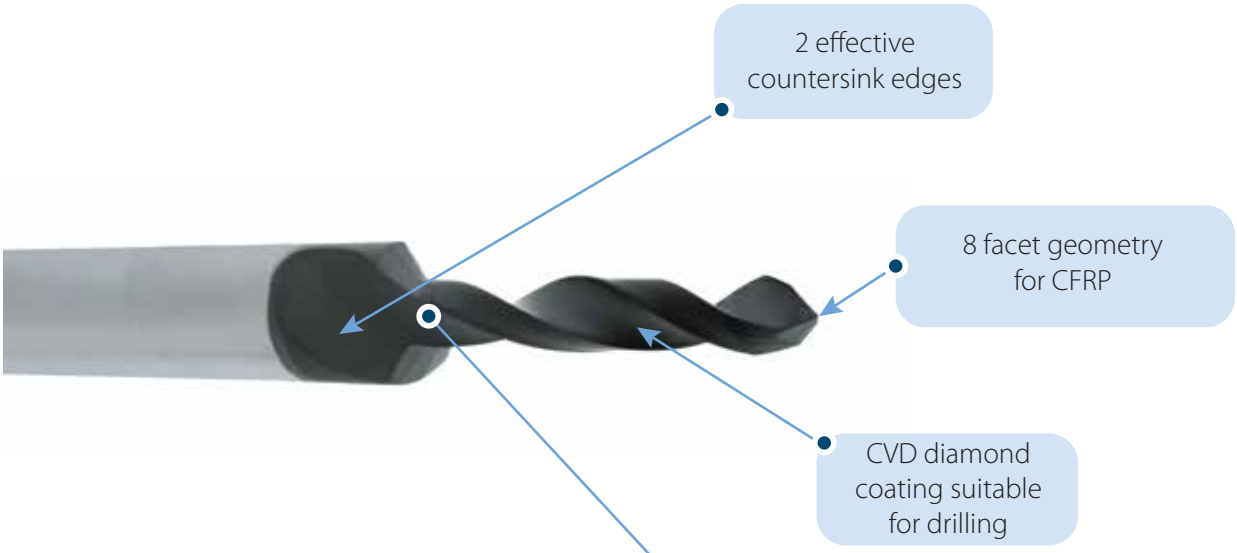
Cutting Diameter (+0.006)	Shank Diameter (h6)	Body Diameter (+/-.01)	CSK Angel	Catalog Number
0.165	1/4	0.375	100/130	CSDR165250I
0.191	3/8	0.500	100/130	CSDR191375I
0.251	5/16	0.625	100/130	CSDR251313I
0.3125	5/16	0.625	100/130	CSDR313313I

● LOC & OAL according request

CVD Drill/CSK



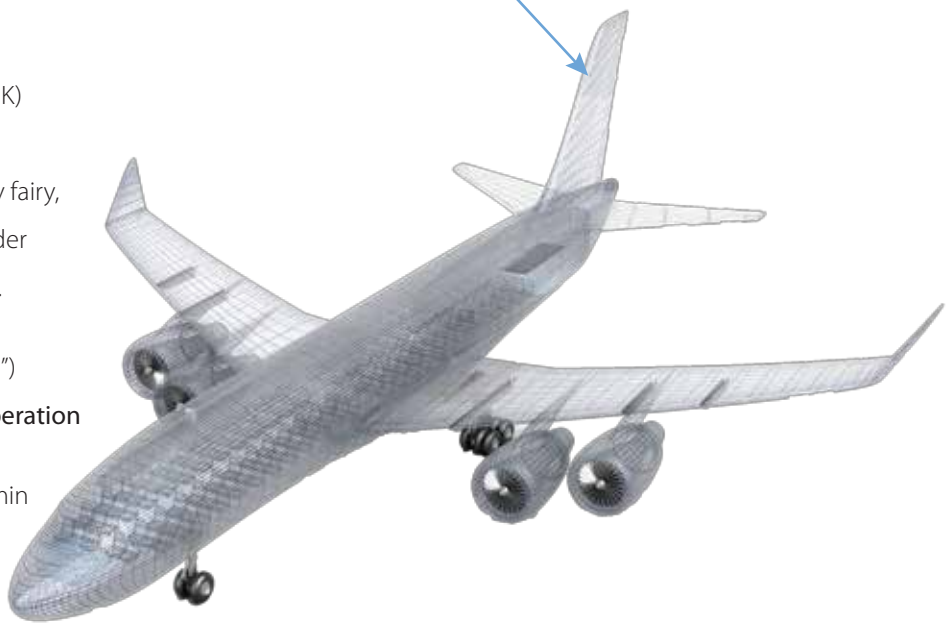
- Economical solution to have two operations in one shot
- Flute length and overall length acc. Request
- CNC usage



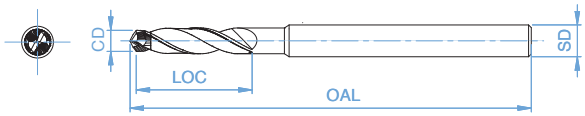
CVD drill/CSK, CSDR Series.

Drilling 4.06mm (x130° CSK) in CFRP stacks (double layered) of A belly fairy, vertical stabilizer and rudder of A commercial airplane.

- **Total CFRP** thickness of 8mm (.313")
- **CNC MRP (Robotic) operation**
- **Typical conditions:** 12,000 RPM, 150 mm/min
- **Typical tool life:** more than 500 holes.

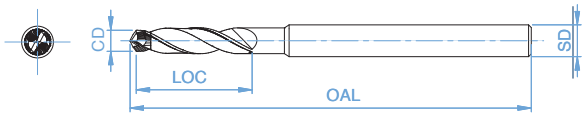


PCD Vein Drill - *Inches*



Cutting Diameter (+0.006)	Shank Diameter (h6)	LOC (+03)	OAL (+06)	Catalog Number
0.165	1/4	1.125	2.75	VNDR165250I
0.191	1/4	1.125	2.75	VNDR191250I
0.251	5/16	1.25	3	VNDR251313I

PCD Vein Drill - *Milimeters*



Cutting Diameter (+0.015)	Shank Diameter (h6)	LOC (+0.8)	OAL (+1.5)	Catalog Number
4.19	6.00	28	70	VNDR042006M
4.85	6.00	28	70	VNDR049006M
6.375	8.00	32	76	VNDR064008M

PCD Vein Drill

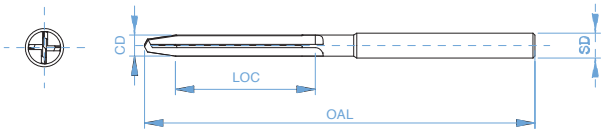
Manual MRP CNC ADU

- Veined PCD sintered in the carbide head
- Reconditionable 3 times
- .165", .191", .251" diameters
- All CFRP and Stack applications

Options:
90 deg. Point for CFRP
130 deg. Point for Stack

Manual

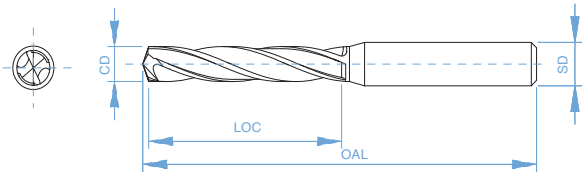
Carbide Drill manual CFRP 4 flutes



Cutting Diameter (+0.015)	Shank Diameter (h6)	LOC (+0.8)	OAL (+1.5)	Catalog Number
2.5	3.00	32	100	MCDR025003M
3.27	4.00	32	100	MCDR033004M
4.14	5.00	40	100	MCDR042005M
4.85	5.00	40	100	MCDR049005M
6.375	7.00	40	100	MCDR064007M
7.970	8.00	40	100	MCDR079008M

Manual

Carbide Drill manual CFRP/Al 2 flutes DM*

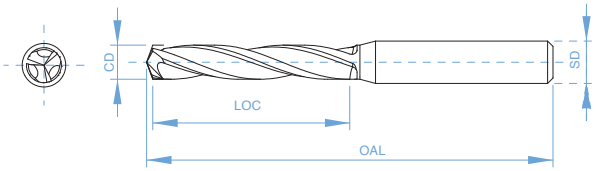


Cutting Diameter (+0.015)	Shank Diameter (h6)	LOC (+0.8)	OAL (+1.5)	Catalog Number
2.5	3.00	32	100	MADR025003M
3.3	4.00	32	100	MADR033004M
4.19	5.00	40	100	MADR042005M
4.85	5.00	40	100	MADR049005M
6.375	7.00	50	100	MADR064007M
7.938	8.00	50	100	MADR079008M

*Can be supplied with front pilot, according request
Double margin and secondary flute or gullet between margins
Pre drilling and drilling
Finish drilling with stepped drill into pre-drilled hole

Manual

Carbide Drill manual CFRP/Ti 3 flutes*



Cutting Diameter (+0.006)	Shank Diameter (h6)	LOC (+0.8)	OAL (+1.5)	Catalog Number
2.5	3.00	32	100	MTDR025003M
3.3	4.00	32	100	MTDR033004M
4.19	5.00	40	100	MTDR042005M
4.85	5.00	40	100	MTDR049005M
6.375	7.00	50	100	MTDR064007M
7.938	8.00	50	100	MTDR079008M

*Can be supplied with front pilot, according request

PCD & CVD DIAMOND END MILLS

Telcon Diamond manufactures all Diamond cutting tools solutions for machining of composite materials. One of the first operations done on a composite material part, after it is taken out of the Autoclave, is trimming or edging. Telcon manufacturers few options of this application:

Among the Diamond end-mills, you can find 2 flutes PCD end-mill for general machining of CFRP parts, slotting, grooving and edging.

In addition, high performance PCD spiral end-mill for high stock removal rates and prolonged tool life with extremely smooth cut and burr free results, utilized, for example, in trimming the openings in airplane fuselage.

The PCD ball-nose end-mill is suitable to create 3D surfaces in composite material parts, where accurate profile is required and cannot be made during material layup.

Additional milling option is a CVD routers, for various applications in composite materials, based carbon fiber or glass fibers. The CVD routers, are to be used, for example, where delamination is crucial or when workpiece thickness is rather low. By design, the CVD router can be used for lower machine loads and under dry or wet conditions.

TELCON

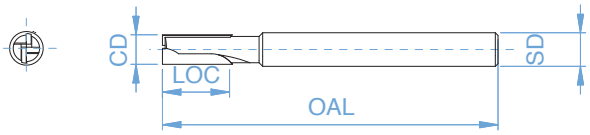
DIAMOND CUTTING TOOLS

The Next Tools Generation

PCD End-Mill

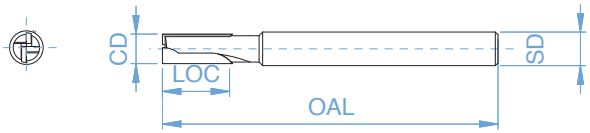
- PCD 2FL straight End-mill
- PCD Spiral Router LH/RH 15° Hypersil
- PCD BN End-mill
- CVD Diamond Router Emicon
- CVD Compression Router
- PCD Multiflute End-mill
- Carbide Router

PCD 2FL straight End-mill - *Inches*



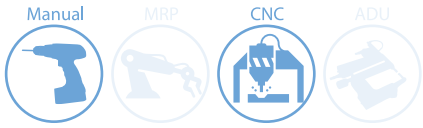
Cutting Diameter (-.002)	Shank Diameter (h6)	LOC (+03)	OAL (+06)	Number of Flutes	Catalog Number
1/8	1/8	1/4	2	1	FOPM125125I
3/16	3/16	5/16	2	1	FOPM188188I
1/4	1/4	3/8	2	2	FOPM250250I
3/8	3/8	1/2	2.5	2	FOPM375375I
1/2	1/2	5/8	3	2	FOPM500500I
5/8	5/8	3/4	3.25	2	FOPM625625I

PCD 2FL straight End-mill - *Milimeters*

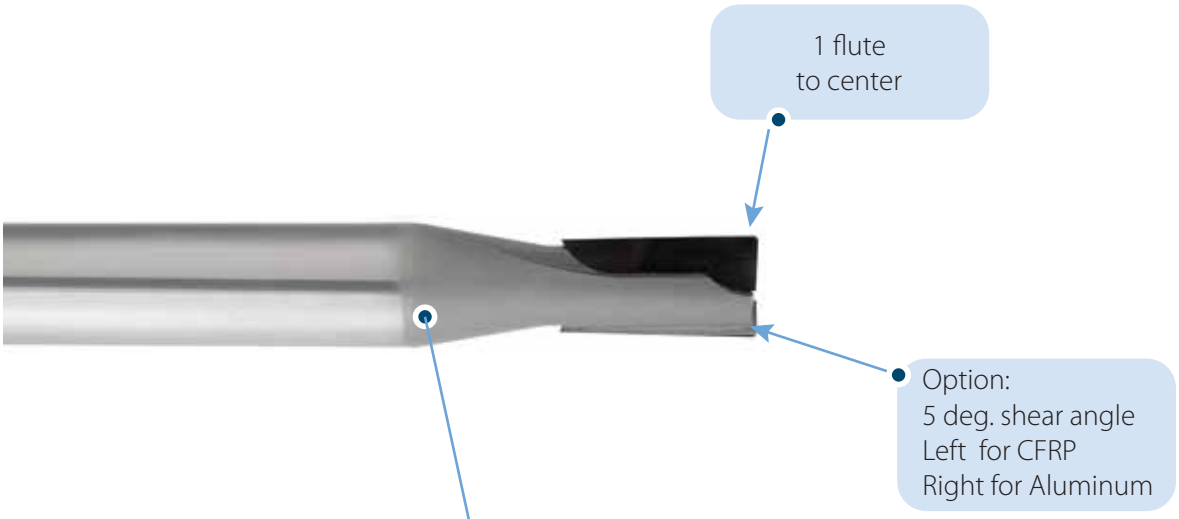


Cutting Diameter (-0.05)	Shank Diameter (h6)	LOC (+03)	OAL (+06)	Number of Flutes	Catalog Number
3	3.00	6	60	1	FOPM003003M
4	4.00	6	60	1	FOPM004004M
6	6.00	10	70	2	FOPM006006M
8	8.00	15	70	2	FOPM008008M
10	10.00	15	75	2	FOPM010010M
12	12.00	18	75	2	FOPM012012M
16	16.00	20	75	2	FOPM016016M

PCD straight 2 fl

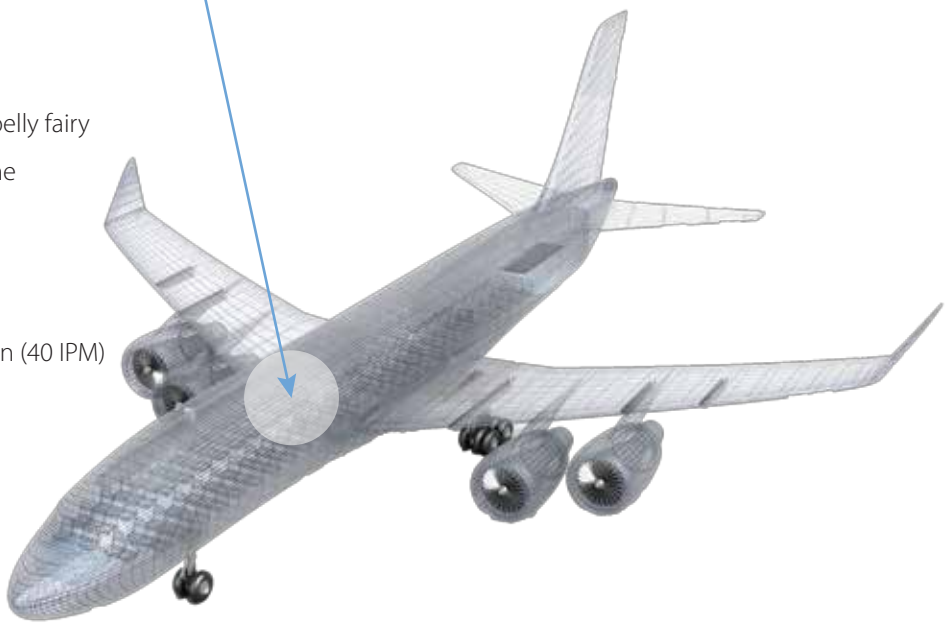


- PCD End-Mill for edging and grooving of CFRP and Aluminum parts
- Reconditioned 3 times
- CNC usage and manual to some extent



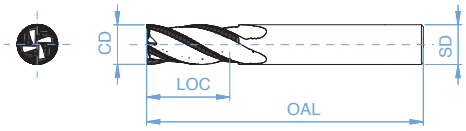
PCD 2 flutes EM, FOPM Series

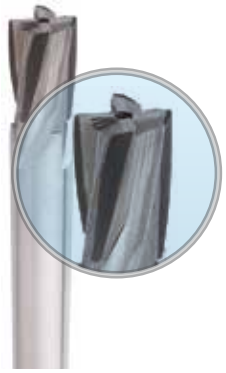
Milling with 8mm (.315") a belly fairy part of a commercial airplane



- CNC operation.
- Typical conditions:
  12,000 RPM, 1000mm/min (40 IPM)
- Typical tool life:
  300 meters in material

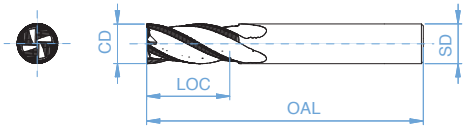
PCD Spiral Router **LH/RH 15° Hypersil** - *Inches*





Cutting Diameter (-.002)	Shank Diameter (h6)	LOC (+03)	OAL (+06)	Number of Flutes	catalog Number LH	Catalog Number RH
1/4	1/4	1/2	2.1/2	3	HPSL250250I	HPSR250250I
3/8	3/8	1/2	3	4	HPSL375375I	HPSR375375I
1/2	1/2	5/8	3.5	4	HPSL500500I	HPSR500500I
5/8	5/8	3/4	4	4	HPSL625625I	HPSR625625I

PCD Spiral Router **LH/RH 15° Hypersil** - *Milimeters*

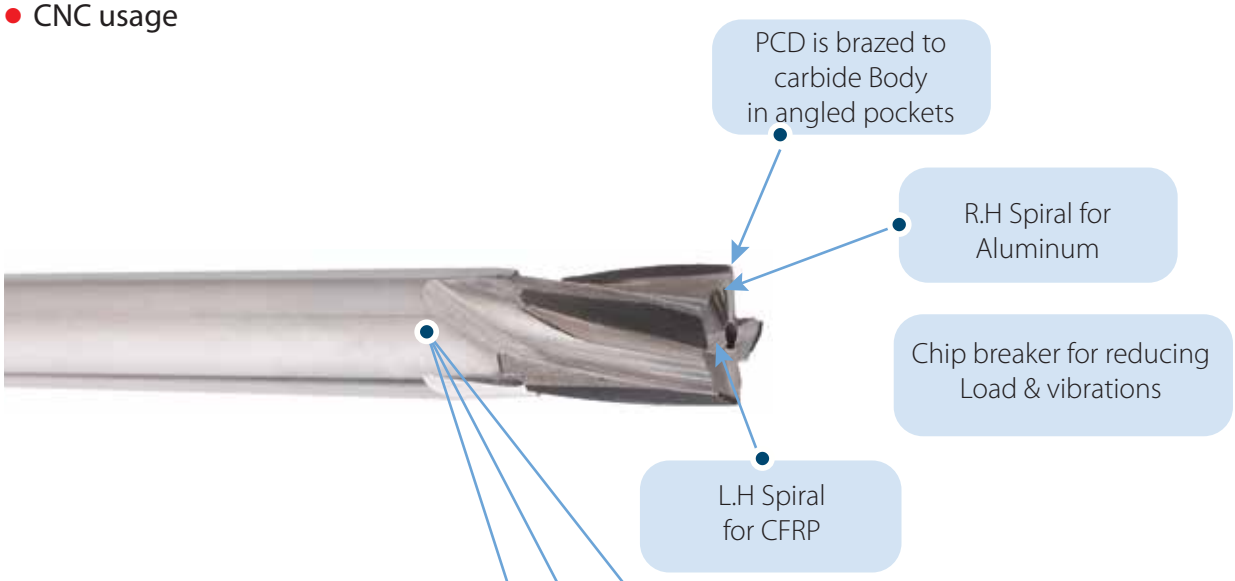


Cutting Diameter (-.005)	Shank Diameter (h6)	LOC (+08)	OAL (+1.5)	Number of Flutes	catalog Number LH	Catalog Number RH
6	6.00	10	63	3	HPSL006006M	HPSR006006M
10	10.00	15	76	4	HPSL010010M	HPSR010010M
12	12.00	15	84	4	HPSL012012M	HPSR012012M
16	16.00	20	100	4	HPSL016016M	HPSR016016M

PCD Spiral 4 fl HP EM

Manual MRP CNC ADU

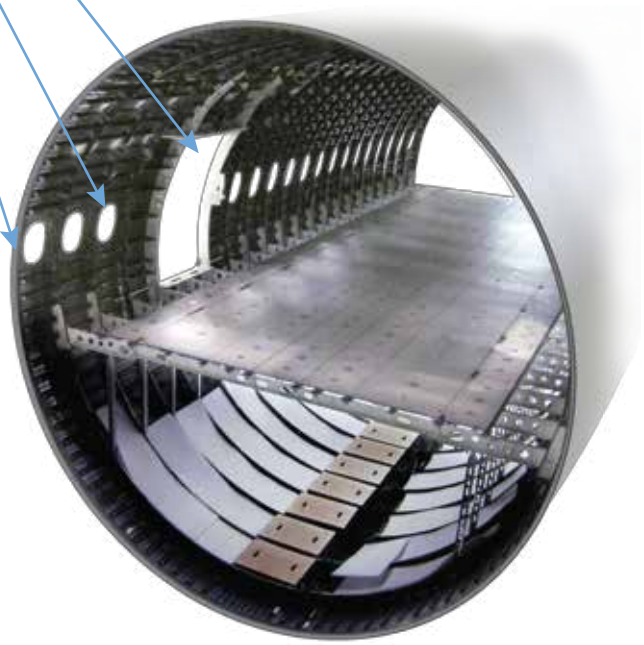
- PCD Spiral L.H/R.H End-Mill with/wo chip breaker
- High stock removal for CFRP and Aluminum
- Best $/meter for milling
- Reconditioned 3 times
- CNC usage



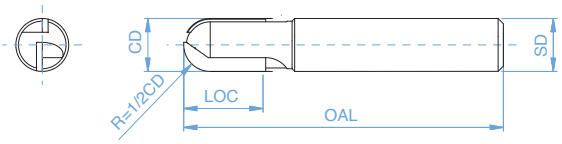
PCD spiral End-Mill, HPSL Series.

Milling with ½" (12.7mm) EM, CFRP windows, doors and end of section of a commercial airplane.

- **CNC operation.**
- **Typical conditions:**
  7200 RPM, 3000 mm/min (118 IPM)
- **Typical tool life:**
  100 meters

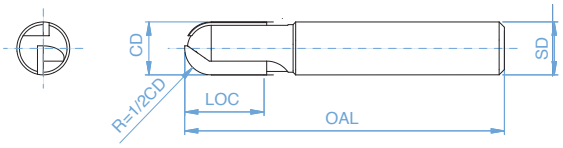


PCD BN End-mill - *Inches*



Cutting Diameter (-.002)	Shank Diameter (h6)	LOC (+03)	OAL (+06)	Number of Flutes	Catalog Number
1/8	1/8	1/4	2	1	BOPM125125I
3/16	3/16	5/16	2	1	BOPM188188I
1/4	1/4	3/8	2	2	BOPM250250I
3/8	3/8	1/2	2.5	2	BOPM375375I
1/2	1/2	5/8	3	2	BOPM500500I
5/8	5/8	3/4	3.25	3	BOPM625625I

PCD BN End-mill - *Milimeters*

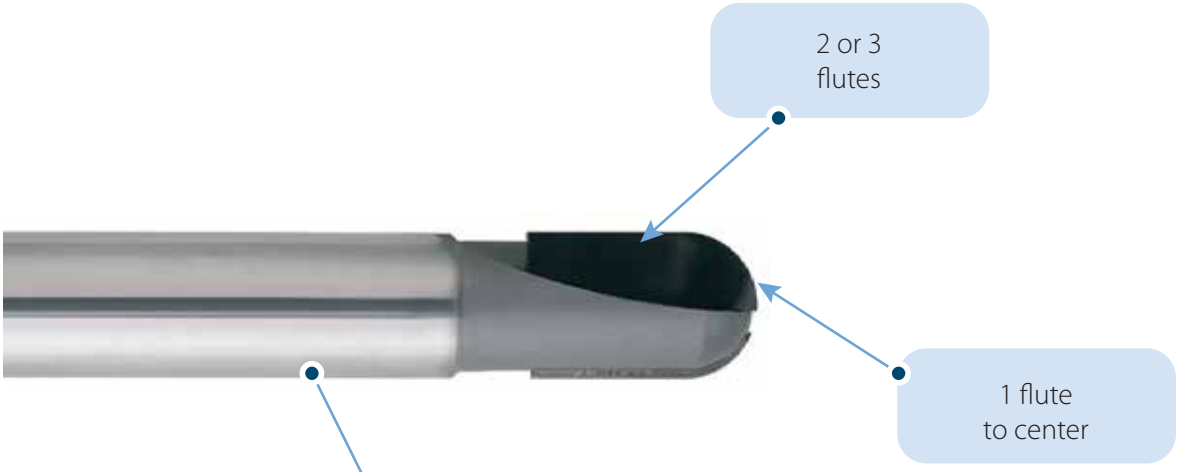


Cutting Diameter (-0.05)	Shank Diameter (h6)	LOC (+03)	OAL (+06)	Number of Flutes	Catalog Number
3	3.00	6	60	1	BOPM003003M
4	4.00	6	60	1	BOPM004004M
6	6.00	10	70	2	BOPM006006M
8	8.00	15	70	2	BOPM008008M
10	10.00	15	75	2	BOPM010010M
12	12.00	18	75	2	BOPM012012M
16	16.00	20	75	3	BOPM016016M

PCD straight 2-3 fl BN

Manual MRP CNC ADU

- PCD Ball Nose End-Mill for internal radius in CFRP and Aluminum parts
- Reconditioned 3 times
- CNC usage

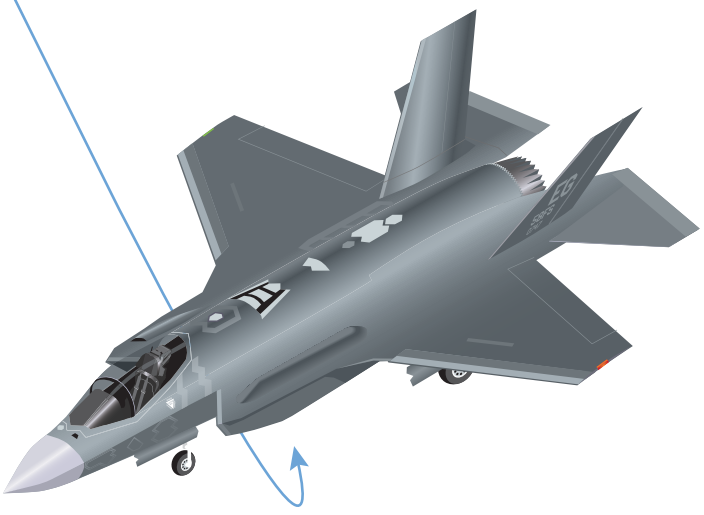


PCD BN EM, BOPM Series (3 Flutes)

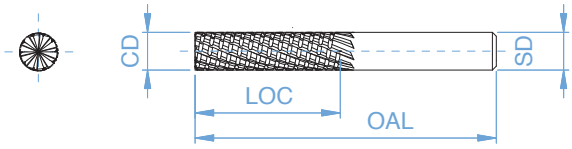
Milling with ¼, ½ and 5/8 in CFRP

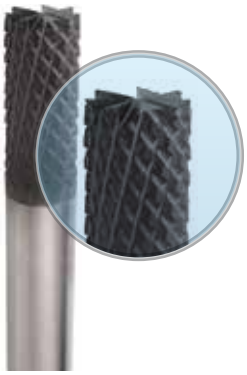
Weapon bay doors of a jetfighter.

- CNC operation.
- Typical conditions:
  15,000 RPM, 1800mm/min (70 IPM)
- Typical tool life:
  10 hours in material



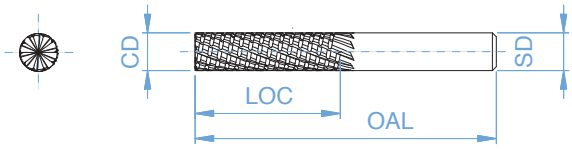
CVD Diamond Router Emicon - *Inches*

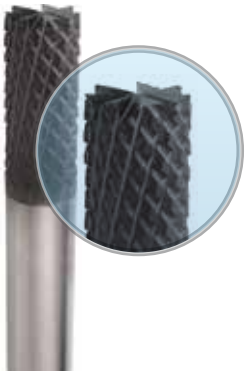




Cutting Diameter (-.002)	Shank Diameter (h6)	LOC (+03)	OAL (+06)	Number of Flutes	Catalog Number
1/4	1/4	1	2.5	6	SCRT250250CVI
3/8	3/8	1.25	3	10	SCRT375375CVI
1/2	1/2	1.5	4	12	SCRT500500CVI

CVD Diamond Router Emicon - *Milimeters*



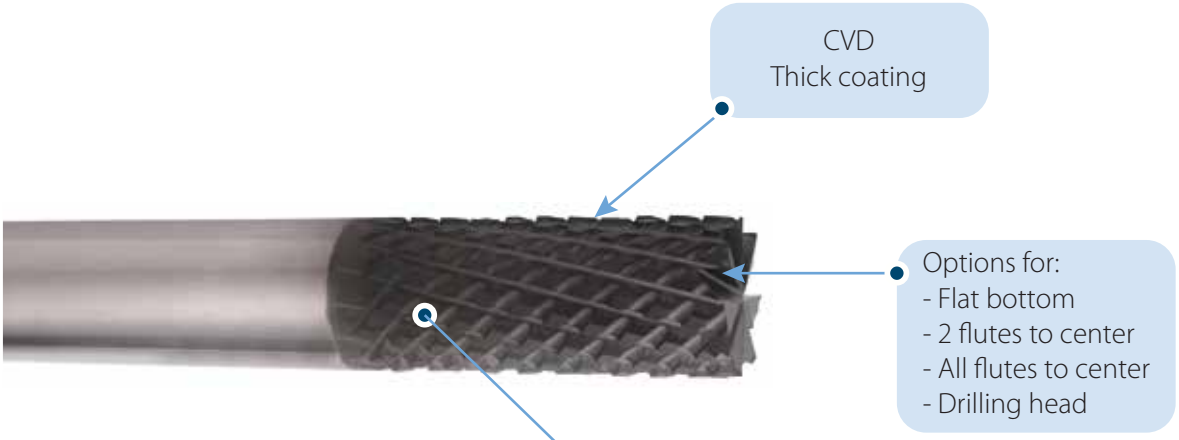


Cutting Diameter (-0.05)	Shank Diameter (h6)	LOC (+03)	OAL (+06)	Number of Flutes	Catalog Number
6	6.00	25	63	6	SCRT006006CVM
8	8.00	32	76	8	SCRT008008CVM
10	10.00	35	76	10	SCRT010010CVM
12	12.00	40	80	12	SCRT012012CVM

CVD Router

Manual MRP CNC ADU

- CVD Router for finishing and rouging of CFRP and GFRP
- Optimal design for bur and delamination free machining
- CNC or Manual operation

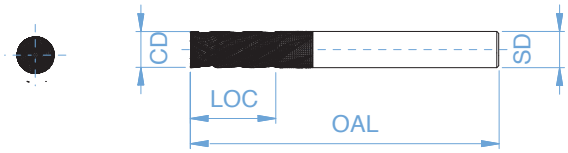


CVD Router, SCRT Series.

Milling with 8mm (.315") Router a CFRP rudder of a commercial airplane.

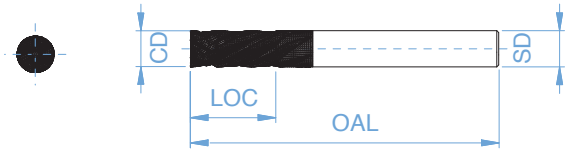
- **CNC operation.**
- **Typical conditions:**
  10,000 RPM, 1000 mm/min (40 IPM)
- **Typical tool life:**
  200 meters

CVD Compression Router - *Inches*



Cutting Diameter (-.002)	Shank Diameter (h6)	LOC (+03)	OAL (+06)	Number of Flutes	catalog Number
1/4	1/4	1	2.5	6	CCRT250250CVI
3/8	3/8	1.25	3	6	CCRT375375CVI
1/2	1/2	1.5	4	6	CCRT500500CVI

CVD Compression Router - *Milimeters*

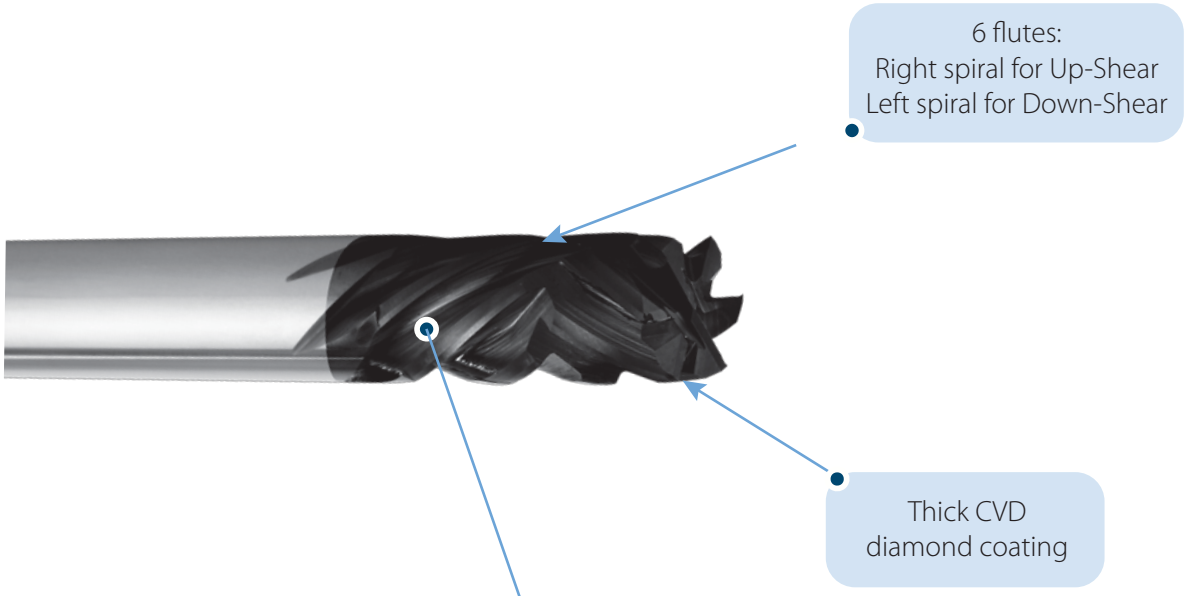


Cutting Diameter (-0.05)	Shank Diameter (h6)	LOC (+03)	OAL (+06)	Number of Flutes	catalog Number
6	6.00	25	63	6	CCRT006006CVM
8	8.00	32	76	6	CCRT008008CVM
10	10.00	35	76	6	CCRT010010CVM
12	12.00	40	80	6	CCRT012012CVM

CVD Compression Router

Manual MRP CNC ADU

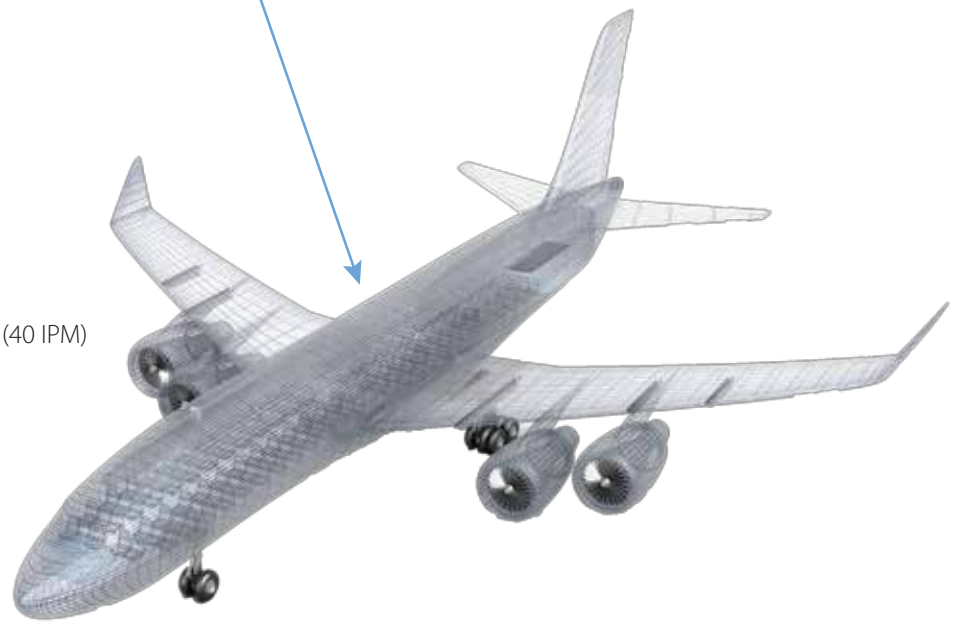
- Designed to minimize layers separation in finishing operation.
- CVD thick coating for longer tool life.
- CNC operation.



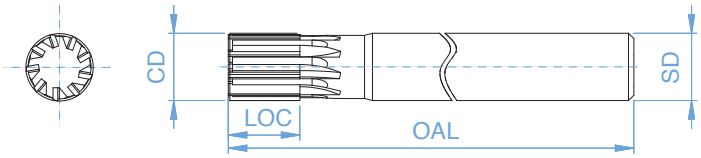
CVD Compression Router
CCRT Series

Milling with ½" dia. CFRP parts of a jetfighter.

- CNC operation.
- Typical conditions:
  5000 RPM, 1000mm/min (40 IPM)

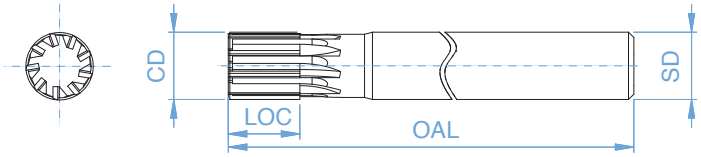


PCD Multiflue End-mill - *Inches*



Cutting Diameter (-.002)	Shank Diameter (h6)	LOC (+03)	OAL (+06)	Number of Flutes	Catalog Number
3/16	3/16	1/4	2.375	3	MOPM1881883I
5/16	5/16	7/16	2.375	3	MOPM3133133I
3/8	3/8	1/3	2.5	5	MOPM3753755I
1/2	1/2	1/2	3	5	MOPM5005005I
1/2	1/2	1/2	3	7	MOPM5005007I
1/2	1/2	1/2	3	9	MOPM5005009I
5/8	5/8	5/8	3.125	7	MOPM6256257I
5/8	5/8	5/8	3.125	9	MOPM6256259I

PCD Multiflue End-mill - *Milimeters*



Cutting Diameter (-.005)	Shank Diameter (h6)	LOC (+08)	OAL (+1.5)	Number of Flutes	Catalog Number
4	4.00	6	50	3	MOPM0040043M
6	6.00	6	60	3	MOPM0060063M
8	8.00	11	60	3	MOPM0080083M
10	10.00	13	63	5	MOPM0100105M
12	12.00	13	75	5	MOPM0120125M
12	12.00	13	75	7	MOPM0120127M
12	12.00	13	75	9	MOPM0120129M
16	16.00	16	79	3	MOPM0160163M
16	16.00	16	79	9	MOPM0160169M

PCD straight Multi-flute

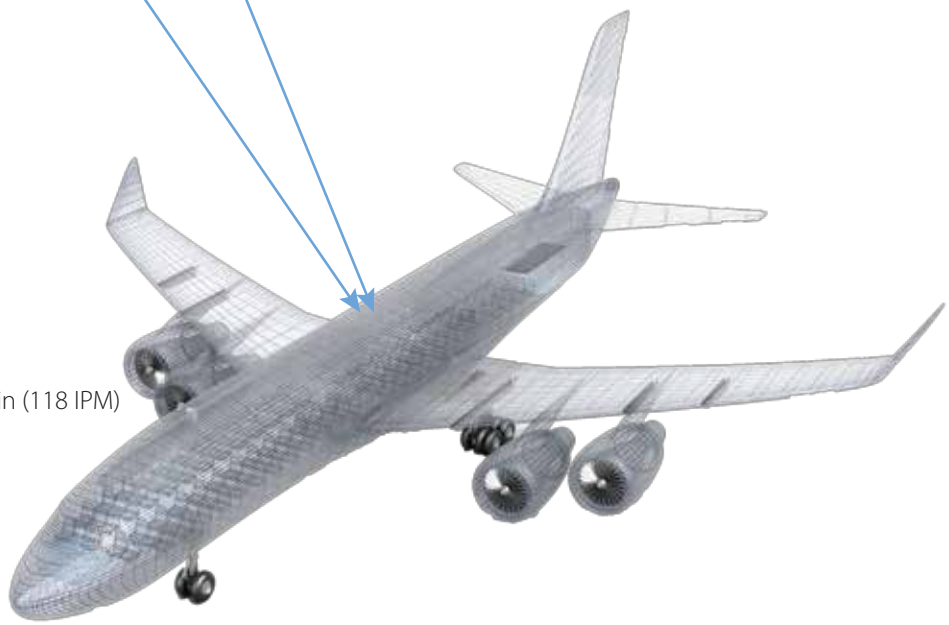
Manual MRP CNC ADU

- PCD End-Mill for side milling and finishing of CFRP parts
- From 3 flutes up to 9 flutes (12mm and up)
- Reconditioned 3 times
- CNC usage

PCD Multi-Flutes EM, MOPM Series

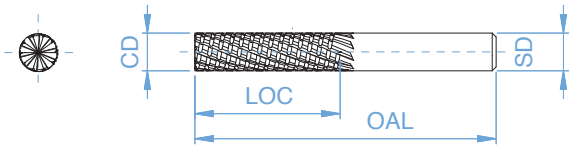
Finish milling with 10mm (.394") various Internal CFRP parts of a commercial airplane.

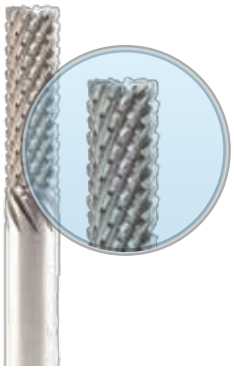
- CNC operation.
- Typical conditions: 10,000 RPM, 3000mm/min (118 IPM)
- Typical tool life: 400 meters in material



Manual MRP CNC ADU

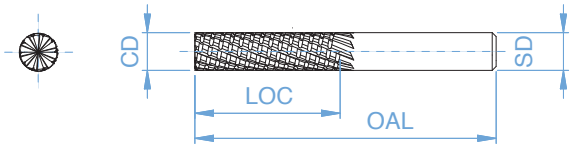
Carbide Router - *Inches*

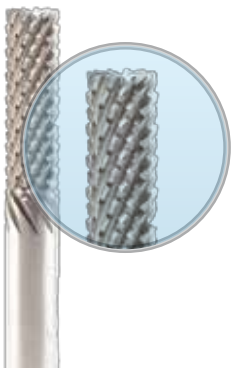




Cutting Diameter (-.002)	Shank Diameter (h6)	LOC (+03)	OAL (+06)	Number of Flutes	Catalog Number
1/4	1/4	1	2.5	6	SCRT250250I
3/8	3/8	1.25	3	10	SCRT375375I
1/2	1/2	1.5	4	12	SCRT500500I

Carbide Router - *Milimeters*





Cutting Diameter (-0.05)	Shank Diameter (h6)	LOC (+03)	OAL (+06)	Number of Flutes	Catalog Number
6	6.00	25	63	6	SCRT006006M
8	8.00	32	76	8	SCRT008008M
10	10.00	35	76	10	SCRT010010M
12	12.00	40	80	12	SCRT012012M


We can ship tools to any destination
TELCON

PCD INTEGRAL COUNTERSINK

Telcon Diamond manufactures all aerospace tools solutions for the machining of composite materials. One of the most common products in airframe assembly lines is diamond integral countersinks.
These are used for creating the chamfer around the pre-drilled hole, mainly in external airplane parts where riveting connection is utilized. Diamond countersinks are in use where composite materials are machined and high wear resistance cutting edge is required. The integral pilot guides the countersink to the center of the hole, preventing chatter and run out. All of the PCD Integral Countersinks are available in standard sizes with two or three flutes and cutting angles of 100deg and 130deg. Additional dimensions are available on request. All the PCD countersinks can be reconditioned multiple times.

PCD INTERCHANGEABLE COUNTERSINK

Telcon Diamond manufactures all Diamond cutting tools solutions for the machining of composite materials. One of the most common products in airframe assembly lines is diamond interchangeable countersinks, which are in use for creating the chamfer around the pre-drilled hole, mainly in external airplane parts where riveting connection is utilized. Diamond countersinks are in use where composite materials are machined and high wear resistance cutting edge is required. The Interchangeable pilot countersink is ideal for the use of cutting the same diameter chamfer with the same countersink but with different diameter pilots. Damaged pilots can be replaced at a fraction of the cost with significant savings. All of the PCD Interchangeable Countersinks are available in standard sizes with two or three flutes and cutting angles of 100deg and 130deg. Additional dimensions are available on request. All the PCD countersinks can be reconditioned multiple times.

TELCON
DIAMOND CUTTING TOOLS

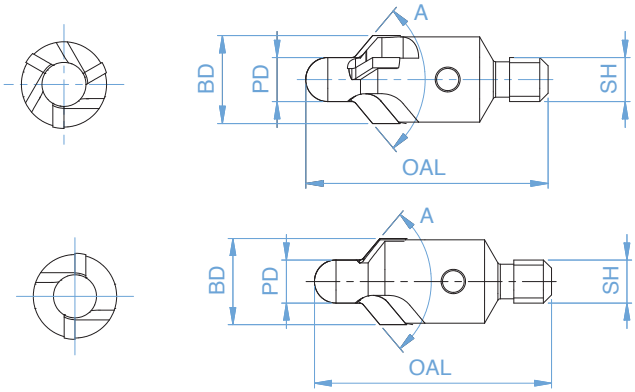
The Next Tools Generation

PCD & Carbide-CSK

- PCD CSK Integral Pilot
- PCD CSK Interchangeable Pilot
- Carbide Tipped CSK Integral Pilot
- Carbide Tipped CSK Interchangeable Pilot

PCD Countersink Integral Pilot - *(Inch)*

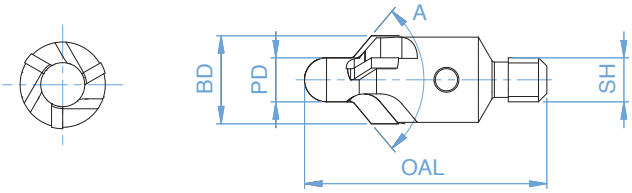
Body Dia. (+/-.03)	Pilot Dia. (-.001)	Number of flutes	CSK Angle (+/-0.5)	Thread shank	cat# 100º 2fl	cat# 130º 2fl	cat# 100º 3fl	cat# 130º 3fl
3/8	0.125	2 / 3	100/130	1/4"-28	CIPK2004125	CIPK2204125	CIPK3004125	CIPK3204125
3/8	0.128	2 / 3	100/130	1/4"-28	CIPK2004128	CIPK2204128	CIPK3004128	CIPK3204128
7/16	0.156	2 / 3	100/130	1/4"-28	CIPK2005156	CIPK2205156	CIPK3005156	CIPK3205156
7/16	0.187	2 / 3	100/130	1/4"-28	CIPK2005187	CIPK2205187	CIPK3005187	CIPK3205187
1/2	0.125	2 / 3	100/130	1/4"-28	CIPK2006125	CIPK2206125	CIPK3006125	CIPK3206125
1/2	0.128	2 / 3	100/130	1/4"-28	CIPK2006128	CIPK2206128	CIPK3006128	CIPK3206128
1/2	0.239	2 / 3	100/130	1/4"-28	CIPK2006239	CIPK2206239	CIPK3006239	CIPK3206239
5/8	0.191	2 / 3	100/130	1/4"-28	CIPK2008191	CIPK2208191	CIPK3008191	CIPK3208191
5/8	0.25	2 / 3	100/130	1/4"-28	CIPK2008250	CIPK2208250	CIPK3008250	CIPK3208250
3/4	0.312	2 / 3	100/130	3/8"-24	CIPK2010312	CIPK2210312	CIPK3010312	CIPK3210312
7/8	0.312	2 / 3	100/130	3/8"-24	CIPK2012312	CIPK2212312	CIPK3012312	CIPK3212312
1	0.312	2 / 3	100/130	7/16"-20	CIPK2014312	CIPK2214312	CIPK3014312	CIPK3214312
1.1/4	0.312	2 / 3	100/130	7/16"-20	CIPK2018312	CIPK2218312	CIPK3018312	CIPK3218312



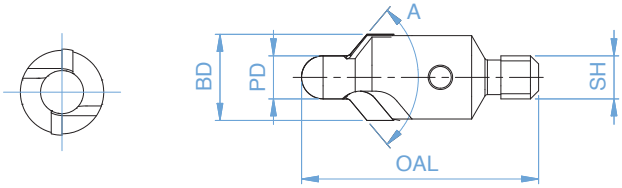
PCD Countersink Integral Pilot - *Milimeters*

Body Dia. (+/-.03)	Pilot Dia. (-.001)	Number of flutes	CSK Angle (+/-0.5)	Thread shank	cat# 100º 2fl	cat# 130º 2fl	cat# 100º 3fl	cat# 130º 3fl
10	3.00	2 / 3	100/130	M6x1.0	CIPK2010300	CIPK2210300	CIPK3010300	CIPK3210300
12	3.00	2 / 3	100/130	M6x1.0	CIPK2012300	CIPK2212300	CIPK3012300	CIPK3212300
14	3.00	2 / 3	100/130	M8x1.0	CIPK2014300	CIPK2214300	CIPK3014300	CIPK3214300
17	4.00	2 / 3	100/130	M8x1.0	CIPK2017400	CIPK2217400	CIPK3017400	CIPK3217400
19	6.00	2 / 3	100/130	M8x1.0	CIPK2019600	CIPK2219600	CIPK3019600	CIPK3219600
22	8.00	2 / 3	100/130	M8x1.0	CIPK2022800	CIPK2222800	CIPK3022800	CIPK3222800
25	8.00	2 / 3	100/130	M8x1.0	CIPK2025800	CIPK2225800	CIPK3025800	CIPK3225800

PCD Countersink Integral 3 FL



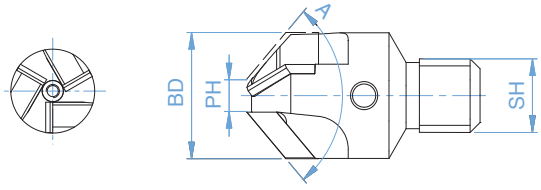
PCD Countersink Integral 2 FL



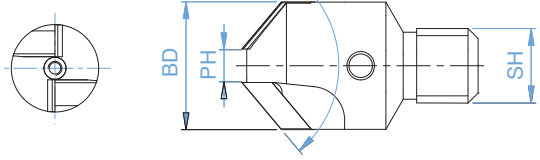
PCD Countersink Interchangeable Pilot - *Inches*

Body Dia. (+/-.03)	Pilot Dia. (-.001)	Number of flutes	CSK Angle (+/-0.5)	Thread shank	cat# 100º 2fl	cat# 130º 2fl	cat# 100º 3fl	cat# 130º 3fl
3/8	0.125	2 / 3	100/130	1/4"-28	CRPK1204125	CRPK1604125	CRPK2404125	CRPK2604125
1/2	0.125	2 / 3	100/130	1/4"-28	CRPK1206125	CRPK1606125	CRPK2406125	CRPK2606125
5/8	0.125	2 / 3	100/130	1/4"-28	CRPK1208188	CRPK1608188	CRPK2408188	CRPK2608188
3/4	0.188	2 / 3	100/130	3/8"-24	CRPK1210188	CRPK1610188	CRPK2410188	CRPK2610188
7/8	0.188	2 / 3	100/130	3/8"-24	CRPK1212188	CRPK1612188	CRPK2412188	CRPK2612188
1	0.188	2 / 3	100/130	7/16"-20	CRPK1214188	CRPK1614188	CRPK2414188	CRPK2614188
1.1/4	0.188	2 / 3	100/130	7/16"-20	CRPK1216188	CRPK1616188	CRPK2416188	CRPK2616188

PCD CSK Interchangeable 3 FL



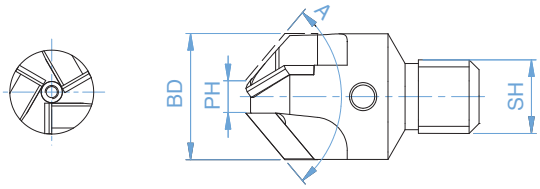
PCD CSK Interchangeable 2 FL



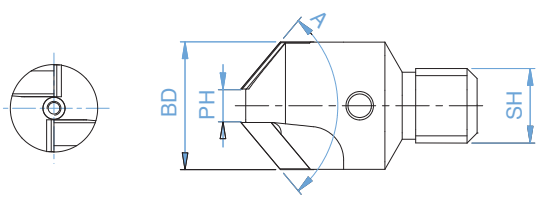
PCD Countersink Interchangeable Pilot - *Milimeters*

Body Dia. (+/-.03)	Pilot Dia. (-.001)	Number of flutes	CSK Angle (+/-0.5)	Thread shank	cat# 100º 2fl	cat# 130º 2fl	cat# 100º 3fl	cat# 130º 3fl
10	2.50	2 / 3	100/130	M6x1.0	CRPK1310250	CRPK1510250	CRPK2510250	CRPK2710250
12	3.00	2 / 3	100/130	M6x1.0	CRPK1312300	CRPK1512300	CRPK2512300	CRPK2712300
14	3.00	2 / 3	100/130	M8x1.0	CRPK1314300	CRPK1514300	CRPK2514300	CRPK2714300
17	3.00	2 / 3	100/130	M8x1.0	CRPK1317300	CRPK1517300	CRPK2517300	CRPK2717300
19	4.00	2 / 3	100/130	M8x1.0	CRPK1319400	CRPK1519400	CRPK2519400	CRPK2719400
21	4.00	2 / 3	100/130	M8x1.0	CRPK1321400	CRPK1521400	CRPK2521400	CRPK2721400

PCD CSK Interchangeable 3 FL

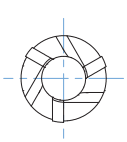


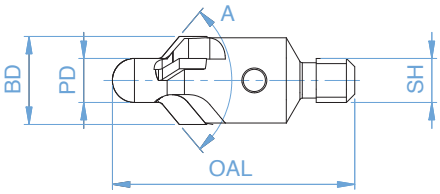
PCD CSK Interchangeable 2 FL

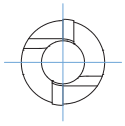


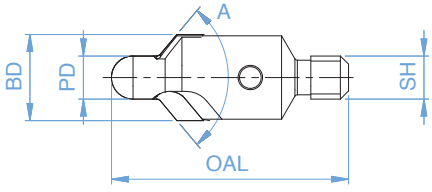
Carbide Tipped Countersink Integral Pilot - *(Inch)*

Body Dia. (+/-.03)	Pilot Dia. (-.001)	Number of flutes	CSK Angle (+/-0.5)	Thread shank	cat# 100º 2fl	cat# 130º 2fl	cat# 100º 3fl	cat# 130º 3fl
3/8	0.125	2 / 3	100/130	1/4"-28	CIPC2004125	CIPC2204125	CIPC3004125	CIPC3204125
3/8	0.128	2 / 3	100/130	1/4"-28	CIPC2004128	CIPC2204128	CIPC3004128	CIPC3204128
7/16	0.156	2 / 3	100/130	1/4"-28	CIPC2005156	CIPC2205156	CIPC3005156	CIPC3205156
7/16	0.187	2 / 3	100/130	1/4"-28	CIPC2005187	CIPC2205187	CIPC3005187	CIPC3205187
1/2	0.125	2 / 3	100/130	1/4"-28	CIPC2006125	CIPC2206125	CIPC3006125	CIPC3206125
1/2	0.128	2 / 3	100/130	1/4"-28	CIPC2006128	CIPC2206128	CIPC3006128	CIPC3206128
1/2	0.239	2 / 3	100/130	1/4"-28	CIPC2006239	CIPC2206239	CIPC3006239	CIPC3206239
5/8	0.191	2 / 3	100/130	1/4"-28	CIPC2008191	CIPC2208191	CIPC3008191	CIPC3208191
5/8	0.25	2 / 3	100/130	1/4"-28	CIPC2008250	CIPC2208250	CIPC3008250	CIPC3208250
3/4	0.312	2 / 3	100/130	3/8"-24	CIPC2010312	CIPC2210312	CIPC3010312	CIPC3210312
7/8	0.312	2 / 3	100/130	3/8"-24	CIPC2012312	CIPC2212312	CIPC3012312	CIPC3212312
1	0.312	2 / 3	100/130	7/16"-20	CIPC2014312	CIPC2214312	CIPC3014312	CIPC3214312
1.1/4	0.312	2 / 3	100/130	7/16"-20	CIPC2018312	CIPC2218312	CIPC3018312	CIPC3218312





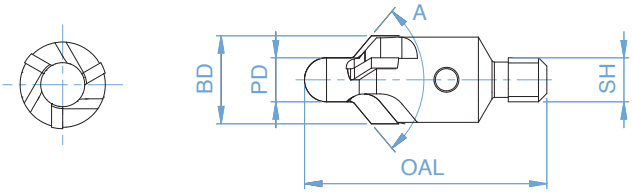




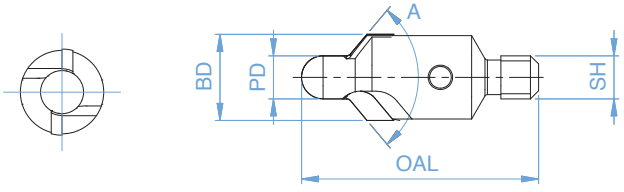
Carbide Tipped Countersink Integral Pilot - *Milimeters*

Body Dia. (+/-.03)	Pilot Dia. (-.001)	Number of flutes	CSK Angle (+/-0.5)	Thread shank	cat# 100º 2fl	cat# 130º 2fl	cat# 100º 3fl	cat# 130º 3fl
10	3.00	2 / 3	100/130	M6x1.0	CIPC2010300	CIPC2210300	CIPC3010300	CIPC3210300
12	3.00	2 / 3	100/130	M6x1.0	CIPC2012300	CIPC2212300	CIPC3012300	CIPC3212300
14	3.00	2 / 3	100/130	M8x1.0	CIPC2014300	CIPC2214300	CIPC3014300	CIPC3214300
17	4.00	2 / 3	100/130	M8x1.0	CIPC2017400	CIPC2217400	CIPC3017400	CIPC3217400
19	6.00	2 / 3	100/130	M8x1.0	CIPC2019600	CIPC2219600	CIPC3019600	CIPC3219600
22	8.00	2 / 3	100/130	M8x1.0	CIPC2022800	CIPC2222800	CIPC3022800	CIPC3222800
25	8.00	2 / 3	100/130	M8x1.0	CIPC2025800	CIPC2225800	CIPC3025800	CIPC3225800

Carbide Tipped CSK Integral 3 FL



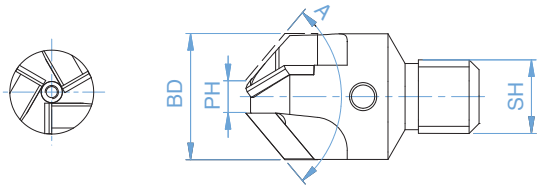
Carbide Tipped CSK Integral 2 FL



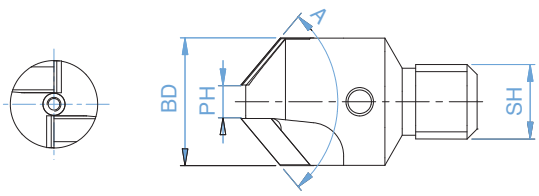
Carbide Tipped Countersink Interchangeable Pilot - *Inches*

Body Dia. (+/-.03)	Pilot Dia. (-.001)	Number of flutes	CSK Angle (+/-0.5)	Thread shank	cat# 100º 2fl	cat# 130º 2fl	cat# 100º 3fl	cat# 130º 3fl
3/8	0.125	2 / 3	100/130	1/4"-28	CRPC1204125	CRPC1604125	CRPC2404125	CRPC2604125
1/2	0.125	2 / 3	100/130	1/4"-28	CRPC1206125	CRPC1606125	CRPC2406125	CRPC2606125
5/8	0.125	2 / 3	100/130	1/4"-28	CRPC1208188	CRPC1608188	CRPC2408188	CRPC2608188
3/4	0.188	2 / 3	100/130	3/8"-24	CRPC1210188	CRPC1610188	CRPC2410188	CRPC2610188
7/8	0.188	2 / 3	100/130	3/8"-24	CRPC1212188	CRPC1612188	CRPC2412188	CRPC2612188
1	0.188	2 / 3	100/130	7/16"-20	CRPC1214188	CRPC1614188	CRPC2414188	CRPC2614188
1.1/4	0.188	2 / 3	100/130	7/16"-20	CRPC1216188	CRPC1616188	CRPC2416188	CRPC2616188

Carbide Tipped CSK Interchangeable 3 FL



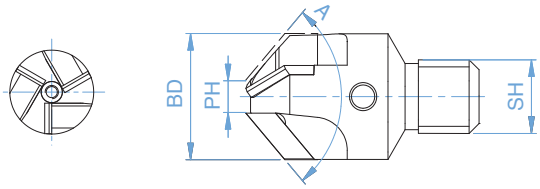
Carbide Tipped CSK Interchangeable 2 FL



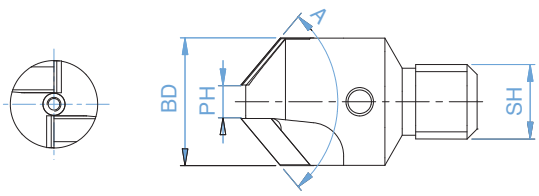
Carbide Tipped Countersink Interchangeable Pilot - *Milimeters*

Body Dia. (+/-.03)	Pilot Dia. (-.001)	Number of flutes	CSK Angle (+/-0.5)	Thread shank	cat# 100º 2fl	cat# 130º 2fl	cat# 100º 3fl	cat# 130º 3fl
10	2.50	2 / 3	100/130	M6x1.0	CRPC1310250	CRPC1510250	CRPC2510250	CRPC2710250
12	3.00	2 / 3	100/130	M6x1.0	CRPC1312300	CRPC1512300	CRPC2512300	CRPC2712300
14	3.00	2 / 3	100/130	M8x1.0	CRPC1314300	CRPC1514300	CRPC2514300	CRPC2714300
17	3.00	2 / 3	100/130	M8x1.0	CRPC1317300	CRPC1517300	CRPC2517300	CRPC2717300
19	4.00	2 / 3	100/130	M8x1.0	CRPC1319400	CRPC1519400	CRPC2519400	CRPC2719400
21	4.00	2 / 3	100/130	M8x1.0	CRPC1321400	CRPC1521400	CRPC2521400	CRPC2721400

Carbide Tipped CSK Interchangeable 3 FL



Carbide Tipped CSK Interchangeable 2 FL



Diamond Grit Tools

Diamond Grit Tools

A competitive edge with complete line of high quality, super abrasive diamond Vacuum Plated or Electro Plated products to cut, mill and grind composites and ceramics. With a great success, various of material can be machined, such as: CFRP, GFRP, MMC, CMC and hard Silicon. The machining parameters are as in grinding, where diamond grit edges effecting the cut. The cut can be made in dry conditions easily and especially designed to handle manual or unstable clamping conditions. The tool structure can be any standard design, such as end mill, hole saw, disc, countersink and also nonstandard shapes to create custom solutions.

Nominal Diameter - Tolerance (Unit = 0.001 mm)

ISO Tolerance Designation	<=3	>3-6	>6-10	>10-18	>18-30	>30-50	>50-80	>80-120	>120-180
d9	-65	-90	-116	-143	-182	-222	-274	-327	-390
d11	-100	-135	-170	-210	-260	-320	-390	-460	-540
e8	-42	-58	-72	-91	-113	-139	-166	-198	-233
e9	-53	-70	-86	-107	-132	-162	-194	-231	-270
f8	-26	-38	-48	-59	-73	-89	-106	-126	-149
f9	-37	-50	-62	-75	-92	-112	-134	-159	-186
h6	0 -6	0 -8	0 -9	0 -11	0 -13	0 -16	0 -19	0 -22	0 -25
h7	0 -10	0 -12	0 -15	0 -18	0 -21	0 -25	0 -30	0 -35	0 -40
h8	0 -14	0 -18	0 -22	0 -27	0 -33	0 -39	0 -46	0 -54	0 -63
h9	0 -25	0 -30	0 -36	0 -43	0 -52	0 -62	0 -74	0 -87	0 -100
h10	0 -40	0 -48	0 -58	0 -70	0 -84	0 -100	0 -120	0 -140	0 -160
h11	0 -60	0 -75	0 -90	0 -110	0 -130	0 -160	0 -190	0 -220	0 -250
h12	0 -100	0 -120	0 -150	0 -180	0 -210	0 -250	0 -300	0 -350	0 -400
h13	0 -140	0 -180	0 -220	0 -270	0 -330	0 -390	0 -460	0 -540	0 -630
js11	+/- 30	+/- 37	+/- 45	+/- 55	+/- 65	+/- 80	+/- 95	+/- 110	+/- 125
js12	+/- 50	+/- 60	+/- 75	+/- 90	+/- 105	+/- 125	+/- 150	+/- 175	+/- 200
js14	+/- 125	+/- 150	+/- 180	+/- 215	+/- 260	+/- 310	+/- 370	+/- 435	+/- 500
js16	+/- 300	+/- 375	+/- 450	+/- 550	+/- 650	+/- 800	+/- 950	+/- 1100	+/- 1250
k9	+25 0	+30 0	+36 0	+43 0	+52 0	+62 0	+74 0	+87 0	+100 0
k10	+40 0	+48 0	+58 0	+70 0	+84 0	+100 0	+120 0	+140 0	+160 0
k11	+60 0	+75 0	+90 0	+110 0	+130 0	+160 0	+190 0	+220 0	+250 0
k12	+90 0	+120 0	+150 0	+180 0	+210 0	+250 0	+300 0	+350 0	+400 0
H5	+4 0	+5 0	+6 0	+8 0	+9 0	+11 0	+13 0	+15 0	+18 0
H6	+6 0	+8 0	+9 0	+11 0	+13 0	+16 0	+19 0	+22 0	+25 0
H7	+10 0	+12 0	+15 0	+18 0	+21 0	+25 0	+30 0	+35 0	+40 0
H11	+60 0	+75 0	+90 0	+110 0	+130 0	+160 0	+190 0	+220 0	+250 0
H12	+100 0	+120 0	+150 0	+180 0	+210 0	+250 0	+300 0	+350 0	+400 0

TELCON

Diamond Cutting Tools

TELCON is ISO 9001, 2015 certified, adopting total quality management (TQM), all of TELCON's divisions relentlessly strive to develop new methods, improve efficiency, and manufacture innovative Diamond tools.

TELCON est certifiée ISO 9001, 2015, adoptant la gestion de la qualité totale (TQM). Toutes les divisions de TELCON s'efforcent sans relâche de développer de nouvelles méthodes, d'améliorer leur efficacité et de fabriquer des outils diamants innovants et performants.

TELCON 通过了 ISO 9001:2015 认证, 采用全面质量管理(TQM) TELCON 的所有部门都在不懈地努力开发新方法, 提高效率, 并制造创新的金刚石工具。

TELCON ist nach ISO 9001, 2015 zertifiziert und übernimmt das Total Quality Management (TQM). Alle Unternehmensbereiche von TELCON sind unermüdlich bestrebt, neue Methoden zu entwickeln, die Effizienz zu verbessern und innovative Diamantwerkzeuge herzustellen.

TELCON tiene la certificación ISO 9001, 2015, adopta el sistema de gestión de calidad total (TQM), todas las divisiones de TELCON se esfuerzan incansablemente por desarrollar nuevas técnicas, mejorar la eficiencia y fabricar innovadoras herramientas de diamante."

TELCON сертифицирована по стандарту ISO 9001:2015 и полностью интегрирована в систему управления качеством (TQM). Все подразделения компании неустанно стремятся разрабатывать новые методы, повышать эффективность и производить инновационный алмазный т.

QUALITY POLICY

TELCON's quality policy defines a holistic approach towards customer's satisfaction and benefit. While maintaining ISO 9001:2015 standards, Telcon saves no efforts in keeping its manufacturing products on the first line of quality and Excellency with presale, sale and post-sale support.

Diamond-tools manufacturing is done using the most modern manufacturing equipment to obtain best repeatability and reproducibility while using the highest quality diamond, carbide and steel grades.

With professional and continuously trained staff, Telcon maintains in-process quality control and final inspection control on the most modern measuring equipment allowing strict and accurate measurements and digitally documented reports for each and every tool for customer's COA.

Telcon's delivery lead times are faster than market standard while keeping highest OTD and lowest return rates.

Professional application engineers support presale efforts to assure the best solution, while addressing post-sale FAQ's to assure application success.

THE STANDARDS INSTITUTION OF ISRAEL

CERTIFICATE

This is to certify that the Quality Management System of

TELCON DIAMOND LTD.

2, Ha'amal St. , Afula , Israel

Has been audited and registered by SII-QCD as conforming to the requirements of :

ISO 9001:2015

This Certificate is Applicable to

Production of diamond cutting tools.

MGMT. SYS.
RvA C 096

Certificate No.:	95524	**Certificate Issue Date:**	04/03/2018
Initial Certification Date:	21/08/2001	**Certification Expiry Date:**	26/02/2020

SII-QCD assumes no liability to any party other than the client, and then only in accordance with the agreed upon Certification Agreement. This certificate's validity is subject to the organization maintaining their system in accordance with SII-QCD requirements for system certification. The continued validity may be verified via scanning the code with a smartphone, or via website www.sii.org.il. This certificate remains the property of SII-QCD.

Ilan Carmit
Acting Director General

R.N 514434331

Eli Cohen-Kagan
Director, Quality & Certification Division

The Standards Institution of Israel

Page 1 of 1

Our Vision: To Enhance Both Global Competitiveness of our Services, with our Uncompromised Quality and Integrity

$$RPM = \frac{\text{Cutting speed (m/min) x 1000}}{\pi \text{ x Diameter (mm)}}$$

$$RPM = \frac{\text{Cutting speed (sfm) x 11.81}}{\pi \text{ x Diameter (inch)}}$$

$$\text{Cutting Speed (m/min)} = \frac{\text{RPM x } \pi \text{ x Diameter (mm)}}{1000}$$

$$\text{Cutting Speed (SFM)} = \frac{\text{RPM x } \pi \text{ x Diameter (inch)}}{11.81}$$

$$\text{Table Feed (mm/min)} = \text{RPM x Feed per revolution (mm)}$$

1 IPM = 25.4 mm/min

1 SFM = 3.33 m/min

Drilling Cutting Conditions

Material	Cutting speed (m/min) PCD/CVD drills	Cutting speed (m/min) Carbide drills	Feed per revolution (mm), by Diameter				
			2-3	4-5	6-7	7-8	8-10
CFRP Unidirectional	100 - 150	70 - 100	0.02-0.03	0.04-0.06	0.05-0.07	0.06-0.08	0.09-0.1
CFRP Bidirectional	80 - 120	60 - 80	0.01-0.02	0.015-0.025	0.02-0.03	0.03-0.04	0.04-0.05
CFRP/Al	100-150	70 - 100	0.07-0.1	0.1-0.14	0.12-0.16	0.13-0.18	0.15-0.2
CFRP/Ti	NA	50 - 70	0.02-0.03	0.04-0.06	0.05-0.07	0.06-0.08	0.09-0.1
GFRP	200 - 300	150 - 250	0.03 - 0.04	0.05-0.07	0.06-0.08	0.08-0.1	0.1-0.15
Aluminum-Si	200 - 300	150 - 250	0.07-0.1	0.1-0.14	0.12-0.16	0.13-0.18	0.15-0.2

* If Aluminum is on exit, then on the Aluminum section only, pecking cycle of 1.5 - 2.0mm with dwell of 0.1mm
* If Titanium is on exit, then on the Titanium section only, pecking cycle of 1.0 - 1.5mm with dwell of 0.1mm
* When part clamping on the jig is unstable, reduce RPM to avoid vibrations.
* CFRP can be machined dry.
* Aluminum and Titanium must be machined with coolant or MQL

Milling Cutting Conditions

Material	Cutting speed (m/min) PCD/CVD End_Mills	Cutting speed (m/min) Carbide End-Mills	Feed per revolution (mm), by Diameter					
			2-3	4-5	6-8	8-10	10-12	12-16
CFRP Unidirectional	150-200	100-150	0.1-0.15	0.15-0.2	0.18-0.23	0.2-0.3	0.25-0.35	0.3-0.4
CFRP Weave	100-150	70-120	0.08-0.12	0.12-0.18	0.15-0.2	0.18-0.25	0.2-0.3	0.25-0.35
GFRP	250-300	150-200	0.1-0.2	0.15-0.25	0.2-0.3	0.25-0.4	0.3-0.4	0.35-0.5
Aluminum-Si	200-300	120-170	0.1-0.15	0.15-0.2	0.18-0.23	0.2-0.3	0.25-0.35	0.3-0.4

* Conditions are for roughing and semifinish. For finishing, reduce feed and speed according desired surface and accuracy requirements.
* When part clamping on the jig is unstable, reduce RPM to avoid vibrations.
* CFRP can be machined dry
* Aluminum must be machined with coolant or MQL

AEROSPACE

The aerospace market is one of the largest and most important to the composites industry. There is substantial use of composites, (both inside and outside the vehicle) in Commercial aircraft, military aircraft, helicopters, business jets, and general aviation aircraft. In Boeing's 787, for instance, 50% of the plane's weight is made of composites materials, assisting with weight reduction and improved fuel efficiency.
Composites parts, which are mostly in the form of carbon fiber with epoxy polymer (CFRP), exist in many parts of the airplane body, such as: fuselage, wings, vertical & horizontal stabilizers, doors, covers, constructive beams etc.
Composite materials are machined in CNC machining centers and in manual operations on the assembly lines.
Due to their abrasive characteristics, composite materials are mostly machined with PCD and CVD diamond tools, to achieve higher wear resistance and prolonged tool life.
TELCON's high performance diamond PCD and CVD tools are a proven solution for machining of composite materials and are supplied to major aerospace companies such as Boeing, Airbus and Lockheed Martin.

AUTOMOTIVE

Automotive aluminum parts with high silicone content, such as: cylinder block and cylinder head requires high-abrasion resistant diamond tools such as PCD inserts, PCD end mills, PCD ball mills and PCD drills – all of which TELCON supplies successfully to major industry manufacturers.

Exterior Automotive parts such as doors, bumpers and interior parts (such as the passenger cage) are made from composites. These are mostly SMC materials and require high abrasion resistance tools such as CVD diamond routers and drills – all of which TELCON supplies successfully to major industry manufacturers.

DENTAL

Dental crowns are machined in two stages: the first stage is done in soft material with 5 axis CNC machines with carbide end-mils where most of the material is removed. The second stage is done with grinding pins after sintering of the crown (to hard condition). TELCON is one of the first and only companies to manufacture micro PCD ball-mills which allow skipping the 1st stage of soft material and machining of the crown already in hard condition, enabling using natural hard ceramics (without the need to sinter), while shortening patient chair-time.

ELECTRONICS & SEMICONDUCTORS

Electronic Printed Circuit Boards (PCB) are a basic part of any electric equipment. They are made of glass fiber/Epoxy matrix and require micro drilling and milling tools ranging mainly from 0.1 – 1.0mm. TELCON is one of the first and only companies to present high performance micro PCD drills which are designed for high abrasion resistance up to 10 times more than standard carbide drills and are in use successfully by major PCB manufacturers.
Semiconductor chips manufacturing industry, requires cleaning and inspection jigs which are made mostly from monocrystalline silicone. The main operation is drilling micro holes, less than 1.0mm. Monocrystalline silicone is extremely high in hardness and abrasiveness and as such, only diamond tools can be used while still maintaining reasonable tool life. TELCON's micro PCD drills are in use successfully at major semiconductors manufacturers.

WOOD

Telcon manufactures a wide range of high-performance, precision engineered polycrystalline diamond (PCD) tipped tools to meet the most exacting demands of today's Woodworking industries.
We offer Straight Router Bits for CNC machines (Z=1+1, Z=2+2, & Z=3), T-Slots, Jointing Cutters, Hinge Boring Bits as well as specially crafted cutting tools for the increasing demand of PCD tools for more efficient machining of Wood and wood-like material specifications. A highly experienced engineering team welcomes 'specials', as well.
Located in a 4,000m2 modern facility, Telcon is equipped with wire CNC E.D.M grinding, E.D.G grinding and CNC grinding center machines. ISO certified, strict quality assurance controls as well as European Standards are meticulously adhered to.

TELCON

DIAMOND CUTTING TOOLS

A Spirit of Perfection

TELCON
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