



OIL & GAS

METALCUTTING SOLUTIONS

Bring more power to your machining

Pioneering Technology



SEM Photomicrograph 3000x

Greenleaf Corporation is a world leader in designing, manufacturing, and applying advanced tooling solutions to meet the unique challenges common to manufacturing components for the oil and gas industry. Steel alloys, stainless steels, in addition to high nickel and cobalt alloys are all part of our daily application range.

Greenleaf has been on the forefront of the metalcutting industry with constant innovation. Since the first patents in the 1930's related to the indexable tooling systems, the focus continues to be on tooling designs and improvements of the materials of the inserts. The goal is to build the best design and processes to maximize the productivity of the manufacturers.

In 1985, Greenleaf pioneered the implementation of whisker-reinforced ceramic cutting tools with the introduction of WG-300®. This opened the door for many more materials to be machined at unprecedented speeds, marking a turning point for the metal-cutting industry as a whole. Development of coated ceramics would follow, starting with the introduction of WG-600® in 2003 and then WG-700™ in

2011. All three of these whisker-reinforced ceramic grades are highly predictable and productive in machining of nickel- and cobalt-based super alloys and other demanding materials at material removal rates up to 10 times higher than traditional carbide.

Greenleaf again transformed the manufacturing process in 2014 with the development of phase-toughened XSYTIN®-1, the first and only ceramic of its kind. XSYTIN®-1 is designed to meet the machining challenges of rough forgings and castings in high-strength materials. The high strength and toughness of XSYTIN®-1 make it the ideal ceramic grade for maximizing productivity.

Greenleaf also offers advanced carbide grades specifically engineered for roughing and precise finishing of alloys commonly used in the oil and gas industry. A combination of high wear resistance, unique chipforms, and proven coatings allow for maximum tool life and cutting efficiency while providing excellent finish quality on the abrasive and difficult-to-machine materials.

Throughout all of manufacturing's diverse industry markets, there is a focus on being and remaining competitive, and the oil and gas industry is no exception. The foundation of Greenleaf's innovations exists with this goal in mind by delivering maximum productivity for our customers while reducing their manufacturing costs. Providing cutting edge solutions with our advanced carbide and ceramic products, Greenleaf continues to tackle difficult oil and gas manufacturing applications around the globe. From manifolds to frac blocks to liner and casing hangers, we have optimized tooling solutions available.

Greenleaf has a long history of innovation in the cutting tool industry with over 70 pending or issued patents in North America, Europe, and Asia. In addition to the patents Greenleaf has developed numerous proprietary tools, tooling and materials that are part of its product offering. An up-to-date list of Greenleaf's patents and trademark registrations can be found at: www.greenleafcorporation.com.

1945



Greenleaf Corporation is formed by Walter Greenleaf, Sr. to market and sell standard and special tooling systems for metal cutting.

1960

Greenleaf Corporation purchases a five-man shop in Saegertown, Pennsylvania and begins to manufacture indexable turning and milling tools.



1969

Greenleaf introduces CVD-coated carbide inserts to the U.S. market – the first company to do so.



1985

Greenleaf introduces WG-300®, the world's first whisker-reinforced ceramic composite grade.



2003

WG-600®, the world's first coated whisker-reinforced ceramic insert, is introduced.



2007

Greenleaf Europe B.V. opens sales and technical support office in Schimmert, The Netherlands for all product shipped from the Saegertown headquarters.

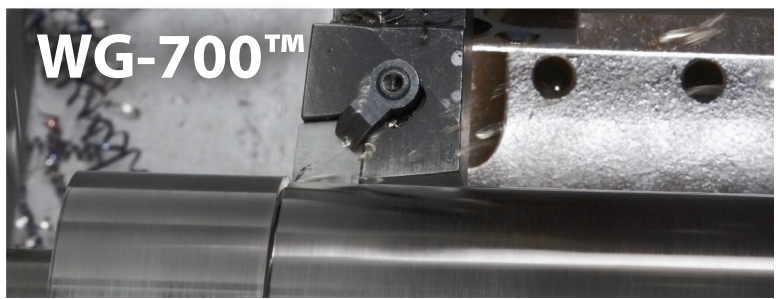
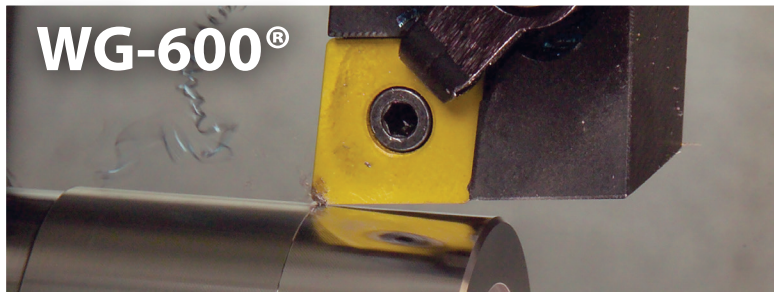
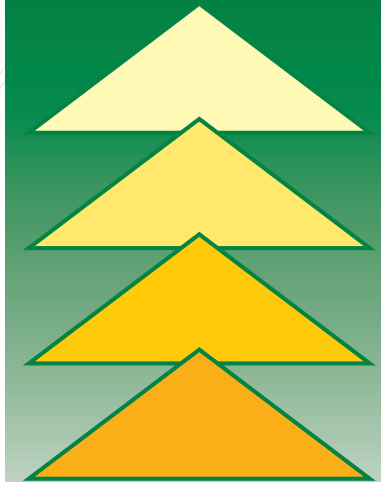


WG-300®, WG-600®,
and WG-700™ are
extremely productive,
with metal removal
rates
up to 10x higher
than traditional
carbide.

Carbide

10X
PRODUCTIVITY

WG-300®
WG-600®
WG-700™



2011

WG-700™, an optimized whisker-reinforced substrate morphology with enhanced nano-layered coating makes its debut.

Greenleaf (Hunan) High-Tech Materials Co., Ltd opens sales and technical support office in Changsha, Hunan, China for all product shipped from Saegertown headquarters.



2013

Machine API-style ring grooves in under 1 minute with Ring Max™



2014

XSYTIN®-1, the first phase-toughened ceramic material, is introduced.



2021-22

XSYTIN®-360 solid end mills reduce cutting forces and provide maximum material removal.



Greenleaf-360 solid end mills offer productivity and predictability in a variety of applications.

2025

Greenleaf introduces Capstone™-360, a ceramic tipped endmill with a carbide shank.

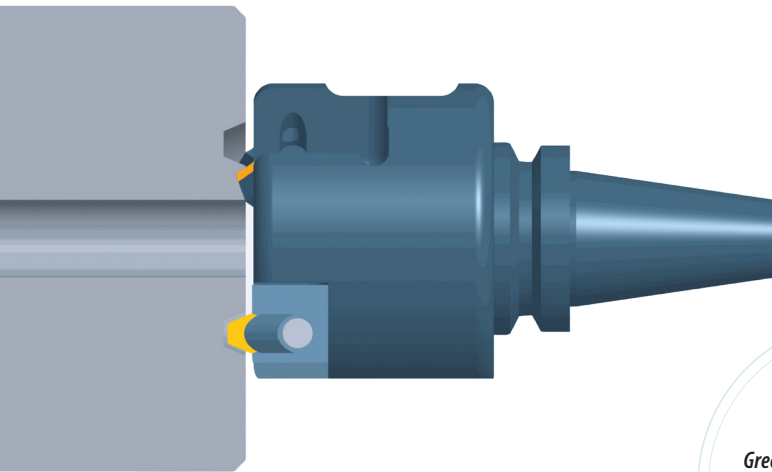
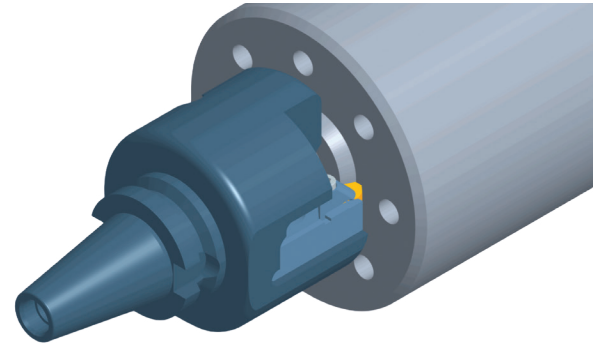


International Sales Offices:

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API Ring Grooves

Significant productivity gains are achievable with Greenleaf's standard and custom tooling solutions. Our innovative Ring Max™ cutter consolidates multiple processes into a single operation, reducing cycle times from over 30 minutes to less than 1 minute for machining API ring grooves. When paired with our Excelerator® End Mills and versatile carbide and ceramic inserts, customers experience dramatic reductions in cycle times and substantial cost savings. By partnering with Greenleaf, manufacturers can optimize their machinery to achieve maximum efficiency and unparalleled performance.



Ring Max™ cutter consolidates multiple processes into a single operation, reducing cycle times from over 30 minutes to less than 1 minute for machining API ring grooves.

FROM 30 MINUTES



1 TO UNDER MINUTE!

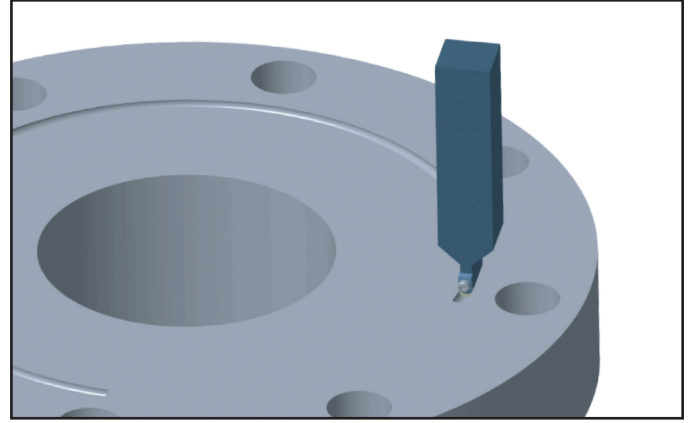
Greenleaf's Ring Max milling cutter line finishes API ring grooves in Inconel 625 clad overlay in less than one minute. Creates industry-standard API grooves - including BX, R and RX styles. Replaceable cartridges designed for easy maintenance. Groove and chamfers are simultaneously machined in one operation. Also available for grooving in stainless steel and alloy steel. Available in both pre-clad and finish cutters.

Grade Recommendations for Common Materials

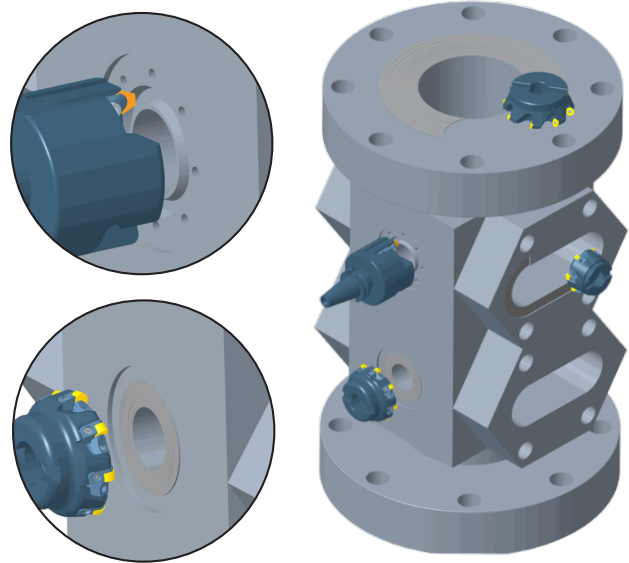
Common Materials	Material Group	Operations	Insert Grades	
			Primary	Secondary
Carbon Steel	Steel	Groove — Turning	GA5036	G-915
		Groove — Milling	GA5036	G-915
Inco 625 Inlay	Super Alloy	Groove — Turning	WG-300®	G-915
		Groove — Milling	WG-300®	G-915
300 Series 400 Series PH	Stainless Steels	Groove — Turning	G-915	G-915
		Groove — Milling	G-915	G-915

Manifolds & BOPs

Greenleaf delivers cutting-edge machining solutions tailored to the demands of the oil and gas industry. Our Excelerator® milling line is designed for exceptional performance in face milling groove surfaces, providing unmatched precision and reliability. When paired with our best in class ceramic inserts, customers benefit from significantly faster cycle times and increased productivity. Additionally, Greenleaf's innovative Ring Max™ cutter combines plunging and chamfering into a single operation, reducing machining time from 30 minutes to less than 1 minute in API ring grooves—setting a new standard for efficiency and performance. Greenleaf's engineering department offers solutions for roughing non-standard API ring grooves as well.



For larger diameter ring grooves or turning where Ringmax™ II or III are not applicable, our Ringmax™ STX toolholders can still be applied. RCGN- or RPGN-2V's, 3V's, or 4V's can also be used for roughing larger rings and specials.



Grade Recommendations for Common Materials

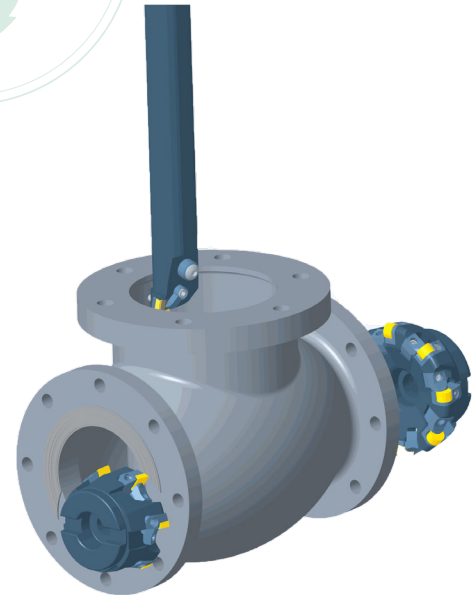
Common Materials	Material Group	Operations	Insert Grades	
			Primary	Secondary
Inco 625 Inlay Super Alloy	Super Alloys	Turning — Roughing	XYTIN®-1	G-915
		Turning — Finishing	G-925	G-915
		Grooving	WG-300®	GA5026
		Milling — Roughing	XYTIN®-1	G-915
		Milling — Finishing	G-925	G-9230
300 Series 400 Series PH	Stainless Steels	Turning — Roughing	G-915	G-9230
		Turning — Finishing	G-9230	G-915
		Milling — Roughing	G-915	G-9230
		Milling — Finishing	G-9230	G-915

Valves & Valve Bodies

Machining Inco 625 inlay and Inco 718 presents unique challenges. Greenleaf's expertise with difficult materials ensures optimal results. Greenleaf's XSYTIN®-1 ceramic grade achieves remarkable productivity in rough turning, milling and pocketing applications. For finishing operations, our premium carbide grades ensure excellent surface finishes. Additionally, Greenleaf's Ring Max™ can increase productivity in machining standard API ring grooves, reducing operations and cycle time.

Try our C4-series milling cutters with XSYTIN®-1 inserts for Inconel 625 weld overlay. C4 cutters offer the option to interchange nests for different insert geometries, all with one tool.

Our Excelerator® endmills and face mills are great for circle interpolating Inconel 625 clad bores with our RNGN-style ceramic inserts.

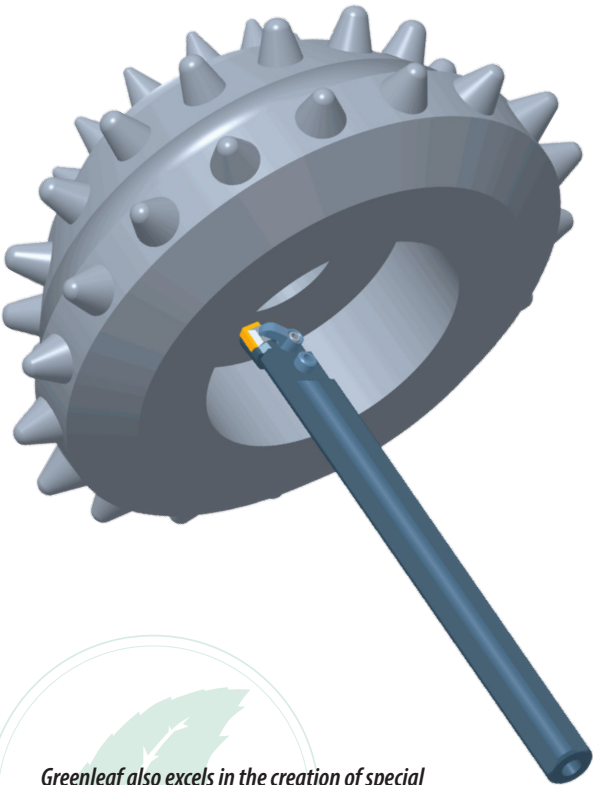
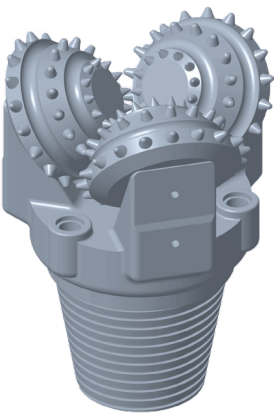


Grade Recommendations for Common Materials

Common Materials	Material Group	Operations	Insert Grades	
			Primary	Secondary
Carbon Steel	Steels	Turning — Roughing	GA5035	GA5036
		Turning — Finishing	GA5025	GA5035
		Milling — Roughing	G-9120	G-915
		Milling — Finishing	G-9120	G-915
Inco 625 Inlay	Nickel Based Super Alloys	Turning — Roughing	XSYTIN®-1	G-915
		Turning — Finishing	G-925	G-915
		Grooving	WG-300®	GA5026
		Milling — Roughing	XSYTIN®-1	G-915
		Milling — Finishing	G-925	G-9230
300 Series 400 Series PH	Stainless Steels	Turning — Roughing	G-915	G-9230
		Turning — Finishing	G-9230	G-915
		Milling — Roughing	G-915	G-9230
		Milling — Finishing	G-9230	G-915
Stellite	Cobalt Based Super Alloys	Turning — Roughing	XSYTIN®-1	WG-300®
		Turning — Finishing	WG-600®	WG-300®
		Milling — Roughing	XSYTIN®-1	WG-300®
		Milling — Finishing	WG-600®	WG-300®

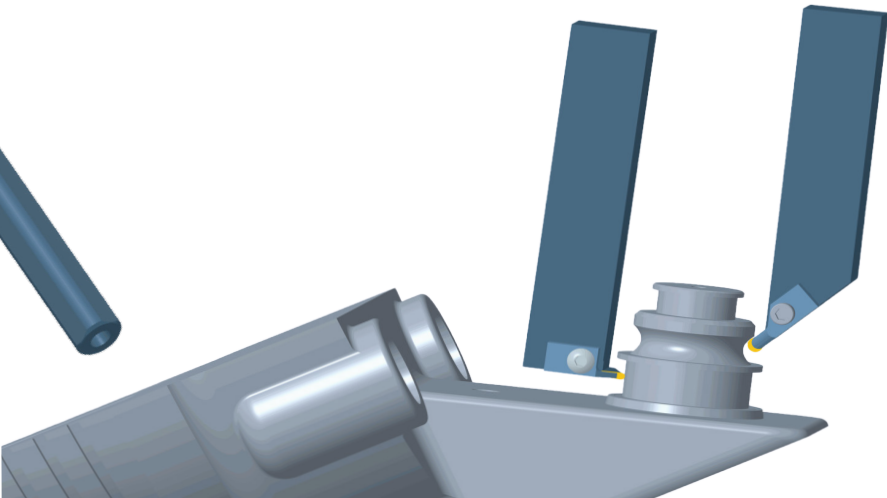
Tri Cone Bits

From the initial stages of machining soft steel to the final processing of hard steel post-heat treatment, Greenleaf Corporation offers comprehensive tooling solutions for every phase of tri-cone bit production. Our expertise ensures precision and efficiency throughout the process, with tools designed for turning, milling, and grooving. Whether you're machining soft steel with carbide or finishing hardened steels with ceramic, our extensive range of insert geometries is designed to meet every challenge.



To complement Greenleaf's standard toolholders and boring bars for carbide inserts, we also offer toolholders and boring bars with unique rake angles specifically designed for use with ceramic inserts.

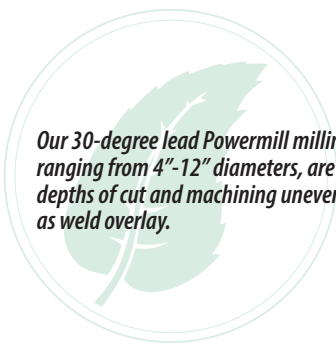
Greenleaf also excels in the creation of special tooling, including: inserts, toolholders and boring bars, and milling cutters.



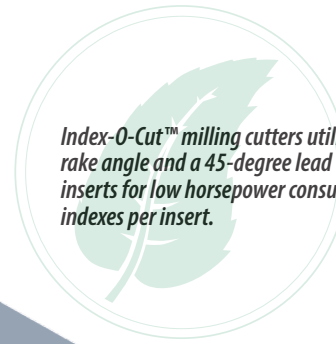
Common Materials	Material Group	Operations	Insert Grades	
			Primary	Secondary
8620, 9315, etc	Alloy Steel	Pre-Heat Turning — Roughing	GA5035	GA5036
		Pre-Heat Turning — Finishing	GA5025	GA5035
		Post-Heat Turning — Finishing	WG-600®	WG-300®

Frac Blocks - Fluid Ends

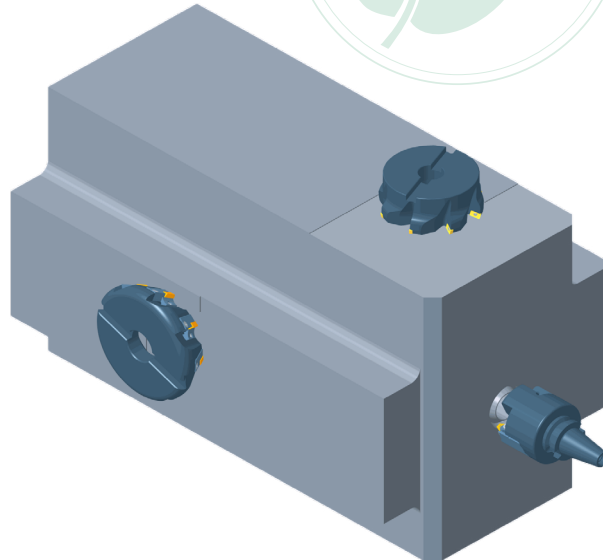
Greenleaf's indexable carbide milling products are engineered to deliver exceptional performance when machining cast iron, steel, and stainless steels. In frac block manufacturing, our carbide inserts are the ideal choice for both roughing and finishing applications. Greenleaf's Powermill®, Hushcut™, and Index-O-Cut™, paired with our carbide inserts, are designed to maximize efficiency, reduce wear, and ensure superior surface finishes for exceptional product quality. Greenleaf-360 solid carbide end mills provide fast, clean results in profiling and counterboring operations, offering the precision and durability needed to tackle even the toughest materials.



Our 30-degree lead Powermill milling cutters, ranging from 4"-12" diameters, are ideal for larger depths of cut and machining uneven surfaces, such as weld overlay.



Index-O-Cut™ milling cutters utilize a high shear rake angle and a 45-degree lead with octagon-style inserts for low horsepower consumption and 8 indexes per insert.



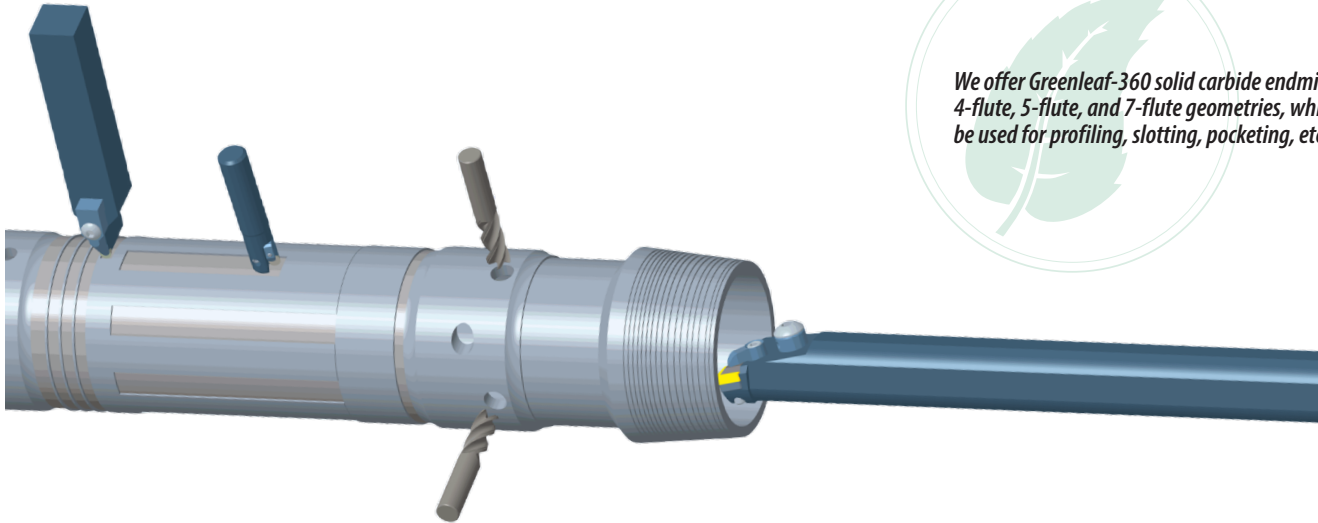
Grade Recommendations for Common Materials

Common Materials	Material Group	Operations	Insert Grades	
			Primary	Secondary
Gray Iron	Cast Iron	Turning — Roughing	GSN100™	GA5023
		Turning — Finishing	GSN100™	GA5023
		Milling — Roughing	GSN100™	GA5023
		Milling — Finishing	GSN100™	GA5023
4140	Steel	Turning — Roughing	GA5035	GA5036
		Turning — Finishing	GA5025	GA5035
		Milling — Roughing	G-9120	G-915
		Milling — Finishing	G-9230	G-915
17-4 PH 15-5 PH	Stainless Steels	Turning — Roughing	G-915	G-9230
		Turning — Finishing	G-925	G-915
		Milling — Roughing	G-915	G-9230
		Milling — Finishing	G-915	G-9230

Liner Hangers & Casing Hangers

Our Greenleaf-360 solid carbide end mills and indexable Excelerator® end mill product line provides exceptional performance when machining alloy steels, stainless steels, and nickel-based alloys. Designed for versatility and efficiency, our Excelerator® end mills allow customers to utilize both ceramic and carbide inserts within the same tool, offering flexibility to meet diverse application needs. This innovative approach can enhance productivity and also deliver extended tool life, ensuring superior value and performance.

We offer Greenleaf-360 solid carbide endmills in 4-flute, 5-flute, and 7-flute geometries, which can be used for profiling, slotting, pocketing, etc.

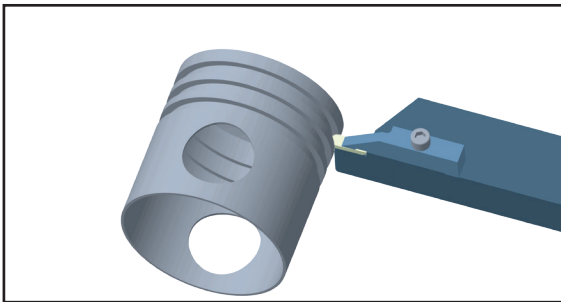
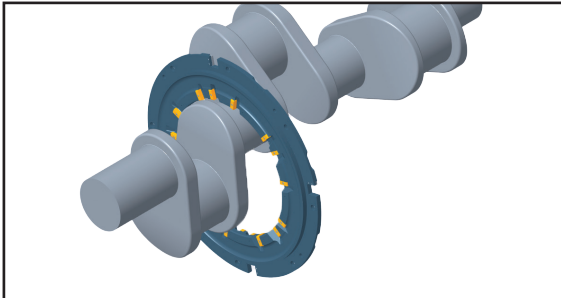
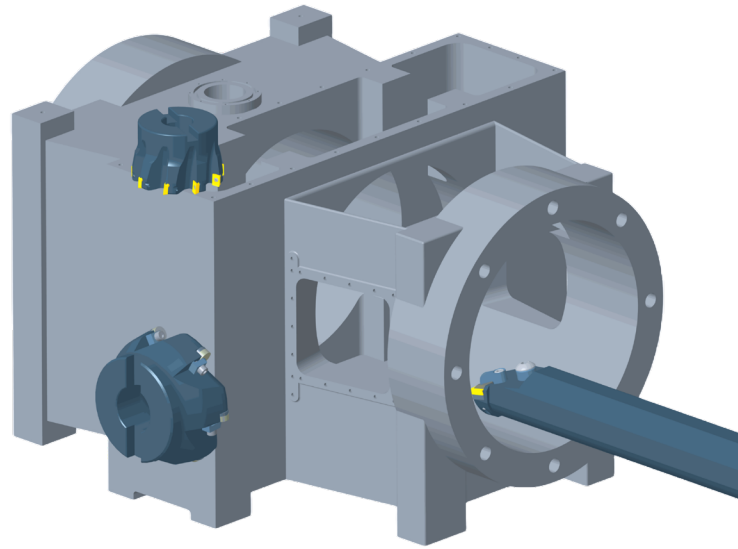


Grade Recommendations for Common Materials

Common Materials	Material Group	Operations	Insert Grades	
			Primary	Secondary
AISI 4140, 4340, etc. 1018, 1025, etc.	Steels	Turning — Roughing	GA5035	GA5036
		Turning — Finishing	GA5025	GA5035
		Milling — Roughing	G-9120	G-915
		Milling — Finishing	G-9230	G-915
300 Series 400 Series PH	Stainless Steels	Turning — Roughing	G-915	G-9230
		Turning — Finishing	G-9230	G-915
		Milling — Roughing	G-915	G-9230
		Milling — Finishing	G-9230	G-915
Inco 718	Super Alloy	Turning — Roughing	XSYTIN®-1	G-915
		Turning — Finishing	WG-600®	G-925
		Milling — Roughing	XSYTIN®-1	G-915
		Milling — Finishing	G-925	G-9230

Compressors

Whether you are machining new components or repairing compressors, Greenleaf provides comprehensive support and high-performance products tailored to meet your manufacturing requirements. With a full range of standard and custom tooling options, we ensure that you are equipped with the most effective tools for the job. One such solution is our GSN100™ ceramic grade, which excels in rough milling, turning and grooving of cast iron. This delivers significant productivity improvements, ensuring enhanced efficiency and performance across a variety of machining needs.



Excelerator® mills are designed for use with either carbide or ceramic inserts with high-speed capability. Our Excelerator® mills range in size from our smallest 3/8" endmills to our 12" C4-series face mills.

Grade Recommendations for Common Materials

Common Materials	Material Group	Operations	Insert Grades	
			Primary	Secondary
Gray Iron Ductile Iron	Cast Iron	Turning — Roughing	GSN100™	GA5023
		Turning — Finishing	GSN100™	GA5023
		Milling — Roughing	GSN100™	GA5023
		Milling — Finishing	GSN100™	GA5023
4130 4140	Alloy Steel	Turning — Roughing	GA5035	GA5036
		Turning — Finishing	GA5025	GA5035
		Milling — Roughing	G-9120	G-915
		Milling — Finishing	G-9230	G-915

Technical Reference – Grades

Carbide Grades



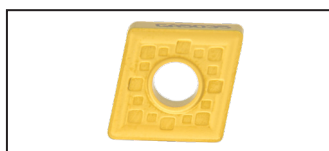
GA5023

A high-performance grade designed for the turning and milling of various grades of cast iron, GA5023 features an advanced MT-CVD coating specifically developed to withstand the abrasiveness of cast iron in machining. Applications range from roughing to finishing in most grades of cast iron, including gray, nodular, and others. The high wear resistance and toughness of GA5023 enable high-speed machining in a wide range of feed rates.



GA5025

A high-speed MT-CVD coated grade developed primarily for turning, GA5025 excels in light roughing and finishing applications of carbon and alloy steels, including select stainless steels. GA5025 is preferred when tool life and wear resistance are essential in steel turning.



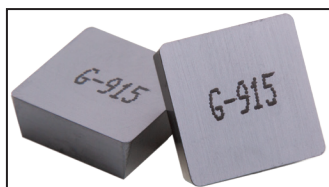
GA5035

A high-performance MT-CVD coated grade for turning all types of steels, GA5035 can be used for heavy roughing to finish-turning applications requiring resistance to heat deformation, thermal shock from interrupted cuts, and abrasion. GA5035 should be applied at high speeds and a moderate range of feeds. GA5035 is the primary choice for steel turning.



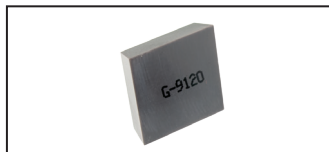
GA5036

A high-speed MT-CVD coated milling grade, GA5036 should be used when milling forged and cast steels and select ductile irons. GA5036 constitutes a unique combination of toughness and heat resistance, making it suitable for heavy and light-duty milling at high cutting speeds. It is a great first choice for all steel milling.



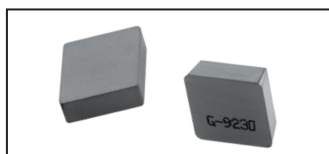
G-915

A multi-layer PVD-coated grade, G-915 is exceptional for milling and interrupted turning of heat-resistant alloys, stainless steels, and low-carbon steels. The coating adds heat and abrasion resistance to the tough substrate. G-915 should be used at moderate speeds and moderate to high feeds. It is a versatile grade that performs well in a variety of materials and operations outside its primary application range, making it a great choice for general machining.



G-9120

This multi-layer PVD-coated carbide grade excels at milling and turning steel castings and forgings. G-9120 was engineered specifically to maximize productivity at moderate to heavy feed rates and high depths of cut, making it ideal for heavy turning applications in steel.



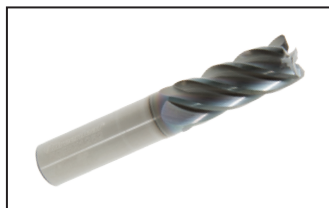
G-9230

A PVD-coated grade designed for the machining of heat-resistant alloys, titanium, hardened steels and stainless steels. G-9230 works particularly well in stainless steel turning, interrupted turning of HRSA, and interrupted turning of titanium. G-9230 has superior wear resistance and toughness and is excellent for casting and forging scale conditions.



G-925

A high-performance multi-layer PVD-coated grade, G-925 is specifically designed for turning abrasive and difficult-to-machine materials. Typical applications include turning of HRSA, titanium and other refractory metals, stainless steels, and ductile cast irons. G-925 exhibits excellent resistance to notching and deformation. Apply at moderate to high speeds and moderate feeds.



Greenleaf-360

Greenleaf-360 carbide end mills are built with a sub-micron grade carbide substrate that delivers exceptional toughness and wear resistance across a wide range of materials—from low carbon steels to heat-resistant alloys. A specially applied PVD coating enhances performance with low friction and high heat resistance, enabling faster speeds and superior wear protection. Together, this foundation and coating allow Greenleaf-360 end mills to achieve 25–50% higher speed and feed rates than the competition, offering reliable performance from roughing to finishing with extended tool life.

Technical Reference – Grades

Ceramic Grades



WG-300®

WG-300® is an uncoated, whisker-reinforced ceramic with excellent wear and shock resistance at high surface speeds. WG-300® is extremely effective at machining nickel- and cobalt-based super alloys, and other common oil and gas materials at metal removal rates up to 10 times higher than carbide. WG-300® excels at removing clean material at a high level of productivity while also maintaining predictability.

- Whisker-reinforced Al_2O_3 ceramic for machining nickel- and cobalt-based super alloys and hard steels
- Excellent thermal and shock resistance at very high surface speeds
- A top choice worldwide for milling, grooving, and turning difficult-to-cut, non-ferrous materials



WG-600®

This coated whisker-reinforced ceramic offers longer tool life and better performance over uncoated ceramics at higher cutting speeds. WG-600® has all the qualities of WG-300® but also demonstrates excellent thermal and wear resistance at very high surface speeds. WG-600® also excels at finishing heat-resistant alloys because of the unique wear-resistant and lubricious coating. It runs faster, has a higher tool life, and produces a superior machined surface.

- Coated whisker-reinforced Al_2O_3 ceramic for machining nickel- and cobalt-based super alloys and hard steels
- Excellent thermal and wear resistance at very high surface speeds
- Extended tool life over uncoated whisker-reinforced ceramics



XSYTIN®-1

A phase-toughened ceramic capable of extreme feed rates, XSYTIN®-1 is one of the only ceramic grades that retains a sharp edge and is resistant to notching. It has unprecedented toughness and strength that allows for slower speeds with high feed rates in oil and gas applications. Because of these qualities, XSYTIN®-1 is a first choice for machining interrupted cuts as well as scale and abrasive materials. It is also ideal for milling due to its inherent toughness.

- Phase-toughened ceramic capable of extreme feed rates
- Ideal for use in interrupted cuts, scale, and milling
- For machining rough forgings and castings of high-strength alloy materials



GSN100™

An engineered blend of hot-pressed silicon nitride and proprietary toughening agents that excels in the machining of cast iron. GSN100™ delivers superior wear and toughness for turning, grooving, and milling applications. It is available in all standard geometries and engineered specials.

- Unique hot-pressed silicon nitride ceramic for machining cast irons
- Superior wear and toughness for turning and milling applications
- Excellent surface finish and longer tool life at elevated speeds and feeds



Capstone™-360

A new line of high-performance end mills featuring a ceramic tip combined with a carbide shank, offering up to 50% higher tool life compared to most commercially available solid ceramic endmills. Designed for superior performance in Heat-Resistant Super Alloys and select Cast Irons. Capstone™-360 excels in applications such as slotting, pocketing, and face milling

- Delivers an exceptional balance of productivity and tool life, maximizing value
- Performs well at a wide range of cutting speeds in HRSA's, and offers similar cycle time and cost reduction benefits in most face-milling applications in cast iron.
- Feature a neck that allows access to cavities and facilitates programming in shoulder milling while maintaining rigidity



XSYTIN®-360

XSYTIN®-360 ceramic end mills combine Greenleaf's phase-toughened XSYTIN®-1 substrate with a unique cutting geometry that offers ten times higher productivity and tremendous cost savings. The strength of the material allows the user to apply chip loads similar to solid carbide end mills with higher speeds common to ceramic machining. These new ceramic end mills provide customers with significant increases in productivity over current solid carbide or ceramic products

- Capable of slotting, pocketing with ramping, and profiling applications maintaining heavy chip loads
- A very broad application range means numerous machining centers are capable of running these end mills
- Extremely versatile end mills with twice the feed rate capability and a much broader speed range!

Custom Engineered Solutions

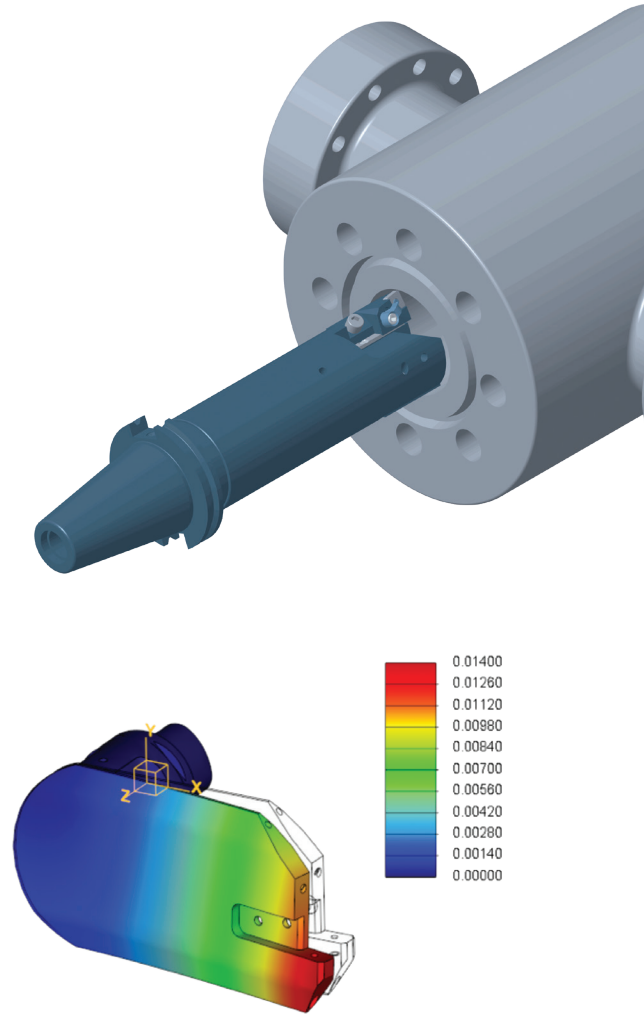
Special Design

Greenleaf proudly offers special and custom-engineered products. Customers from around the world benefit from the collective knowledge of a tenured engineering staff pulling from decades of custom engineered solutions experience, and they use our capabilities to address specific and complex requirements. The solutions offered by the Greenleaf engineering team range from single-tool to full-component-layout solutions for roughing and finishing operations. From small job shops to manufacturing giants, Greenleaf has saved customers countless machining hours with our unique design, application, and manufacturing experience featuring advanced ceramic and carbide insert grades.

Consider special design tooling when standard tooling is simply not capable of meeting part or machine requirements, or when the need for increased metal removal rate is justified. When special design tooling is applied, customers often experience a reduction in scrap and the replacement of many tools with just a single tool. The improvements in cutting tool materials, paired with Greenleaf-designed tooling systems to enhance performance, continue to provide manufacturers the productivity they need to meet their specific challenges.

Advanced Modeling

Greenleaf uses advanced computer solid modeling and analysis software that allows us to fine-tune our custom tool designs to your unique part configuration and application. Computer-Aided Design (CAD) with advanced hardware and software enables fast turnaround of proposal drawings and finished detail drawings for tools as they enter our dedicated manufacturing facilities. This analysis proves extremely beneficial on custom-engineered products for customers who may have specific requirements based on their manufacturing processes. Greenleaf can model strength before use and simulate the strength of tooling for an optimized design.



Application Support

Our commitment to quality and cutting-edge tools and inserts does not end with the purchase of Greenleaf products.

We work with our customers post-purchase to maximize throughput, minimize the need for capital investment, and reduce the overall cost per part without compromising part quality and process security.

The Greenleaf tooling advantage also lies in the experience and knowledge available to every sales engineer and customer from our technical support department. This team of applications engineers is available to provide recommendations for optimal cutting speeds and feeds and to assist in troubleshooting machining applications. All stages of machining heat-resistant alloys, stainless steels, and carbon steels are addressable with Greenleaf tooling and expertise.

We can help by:

- Reducing cycle times
- Developing solutions for difficult-to-machine materials
- Improving process security, eliminating rework and scrap
- Improving surface quality
- Devising a best-in-class machining process for high-volume parts
- Engineering custom solutions to address specific part/material/machining environment needs

Greenleaf Technical Support continually tests and gathers data on innovative tooling to develop the best techniques to maximize performance. Focusing on optimizing every application is a high priority for the technical support team so we can share that knowledge with customers.

Greenleaf tools and technical support expertise can significantly reduce costs and increase productivity.



International Sales Offices:

Greenleaf (Hunan) High-Tech Materials Co., Ltd.: +86-731-89954796 • info@greenleafcorporation.com.cn • www.greenleafcorporation.com.cn | Greenleaf Europe B.V.: +31-45-404-1774 • eurooffice@greenleafcorporation.com

Greenleaf Product Highlights

Excelerator® Milling Cutters

Versatile cutters designed to accept carbide or ceramic inserts



Ball Nose

SIZE RANGE: 3/8" - 1" (10mm - 25mm)

Our ball nose end mills are the only ball nose cutters designed to use ceramic and carbide inserts in the same qualified cutter bodies. Combined with our G-925 carbide and WG-600® and XSYTIN® -1 ceramic inserts, the unique cutter geometry offers better performance, longer tool life and superior cutting action over competitors' mills across a wider spectrum of materials.

U.S. Patent No. 8,177,459 B2



Extreme Feed

SIZE RANGE: 1" - 12" (25mm - 315mm)

Always on the cutting edge of productivity, Greenleaf engineered the Excelerator® XF milling cutter system. The Excelerator® XF is designed for high-feed milling on a wide variety of materials including hard steels and high-temp alloys using Greenleaf's advanced ceramic and carbide inserts.



Face Mills

SIZE RANGE: 2" - 12" (50mm - 315mm)

High-velocity cutters with ceramic inserts for use in a variety of materials at high speeds and accelerated feed rates. Greenleaf cutters have been engineered to offer outstanding performance with ceramic inserts at elevated spindle speeds on the most demanding materials. Precision nests provide multiple insert configurations and body protection. These face mills are available in coarse and fine pitch designs.



End Mills

SIZE RANGE: 3/8" - 2-1/2" (10mm - 63mm)

High-velocity cutters with ceramic inserts for use in a variety of materials at high speeds and accelerated feed rates. Greenleaf's end mills are designed for high-performance milling in difficult to machine materials. Utilizes indexable inserts and offers secure insert clamping at high RPMs. These end mills are available in coarse and fine pitch designs.

Standard Milling Cutters

High-performance milling cutter systems for virtually any application



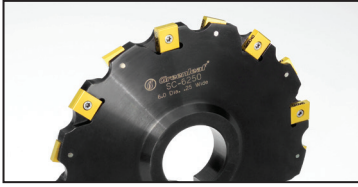
Index-O-Cut™

The Index-O-Cut™ is a high-performance milling system for all materials thanks to its high shear cutting action and the 45° lead angle on the octagon-style insert. These mills are designed to run at higher speeds and feeds than the competition with low horsepower consumption.



Powermill® Cutters

Ideal for heavy-duty cutting in severe interruptions and uneven surfaces. Replaceable components maximize cutter life while providing deep depths of cut. The face mills are available with standard and sinusoidal inserts.



Slotting Cutters

Standard screw-on and mechanically held indexable slotting cutters.

- Powerslot® II – adjustable-width slotter
- Narrow-width slotter

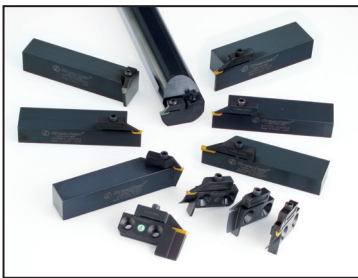


High Shear Cutters

Produce excellent surface finish and material removal rates on a variety of materials. End mills offer a protected screw-on insert pocket design.

Grooving, Profiling & Cut-Off

Offering up to 248 available support blade and shank combinations



Complete System

Greenleaf's toolholder system for grooving, profiling and cut-off applications is designed to accept carbide or ceramic inserts.

The system features a "V"-bottom pocket design for superior insert stability and precision cutting. An interchangeable support blade system includes stocked industry-standard, quick-change shanks.

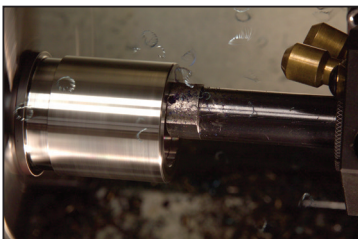
Turning & Boring

Industry-standard turning and boring tools engineered for maximum productivity and tool life



Toolholders

Greenleaf manufactures a complete line of industry standard toolholders in conformance with ANSI specifications for carbide inserts. Toolholder systems for use with ceramic inserts are based upon industry standard hardware; however, geometry and pocket depth are designed to maximize ceramic performance.



Boring Bars

Greenleaf's boring bar systems and cartridges are designed around industry standard hardware. This gives complete interchangeability with other tooling components and minimizes spare parts. Greenleaf can supply heavy metal or "No Chat" high-density tungsten alloy bars that can reduce, and sometimes eliminate chatter for those applications that require a longer reach.



Quick-Change Toolholders

The Greenleaf quick-change toolholders conform to ISO 26623, utilize standard components, and are designed to maximize tool life in carbide and ceramic turning applications.

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Greenleaf Corporation is the industry leader in cutting tool technology development, specializing in the manufacture of high-performance tungsten carbide and ceramic grade inserts and innovative tool-holding systems. Greenleaf continues to build on 80 years of innovation and the legacy established by its founder Walter J. Greenleaf, Sr., which centers on supplying customers with productive solutions to every metal-cutting situation.

Discover more at: <https://greenleafcorporation.com>



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MADE IN THE USA
Greenleaf Corporation
is ISO 9001 Certified.