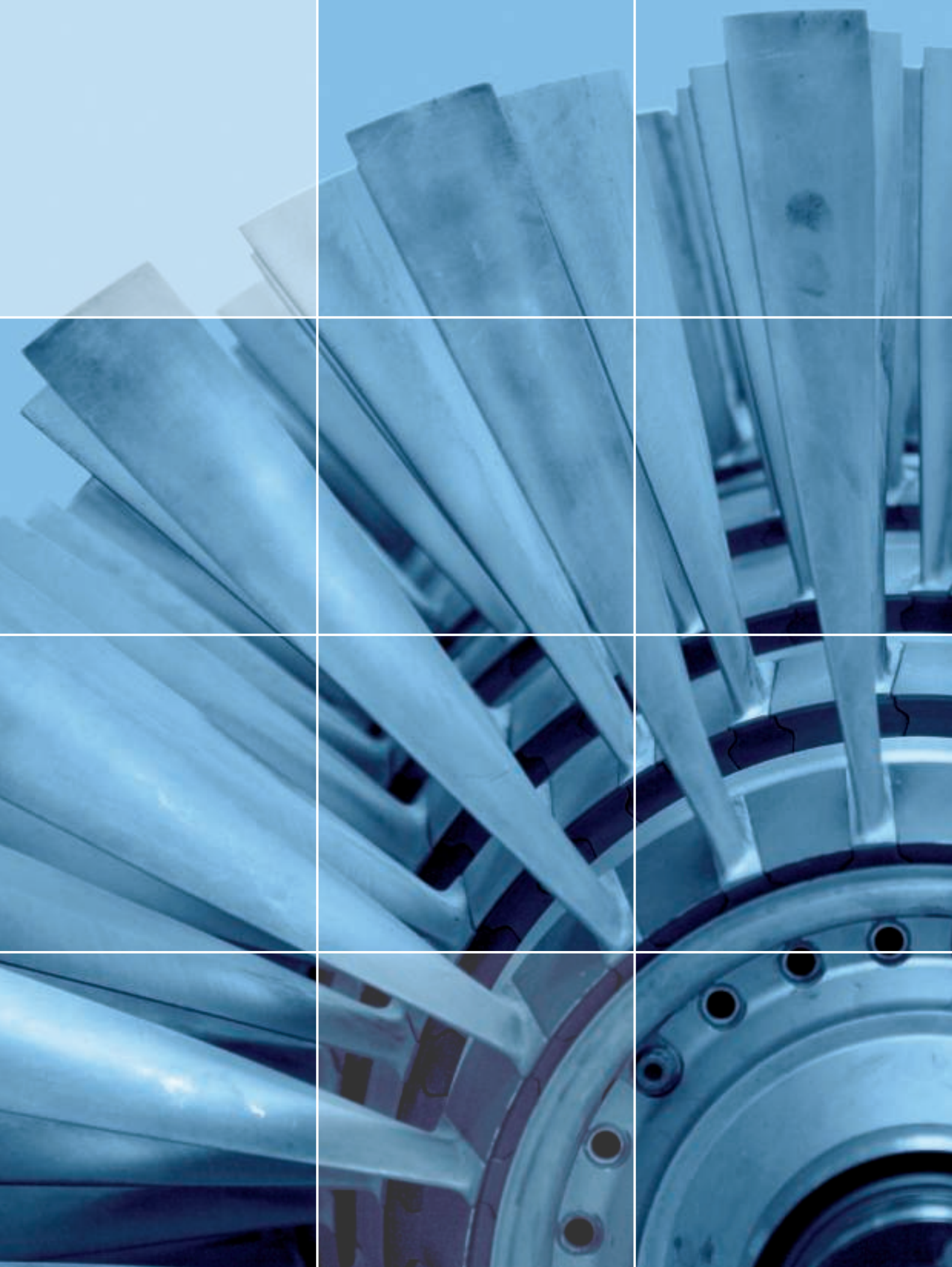




AEROSPACE

**INNOVATIVE TOOLING  
SOLUTIONS.**

**SECO** 





# ENHANCING YOUR COMPETITIVENESS

# DELIVERING EXCELLENCE AND INNOVATION FOR AEROSPACE MANUFACTURERS

Seco works closely with aerospace manufacturers to create and provide solutions that increase productivity and bolster profitability. With 5,000 team members in over 45 countries, we offer a globally networked resource dedicated to solving your challenges and supporting your operations. Through cooperative partnerships with aerospace manufacturers and entities around the world, we monitor trends, identify challenges and develop solutions that overcome the industry's most demanding applications.

When you work with Seco, you experience a true partnership based on trust, respect and communication. Our solutions exceed milling, holmaking, turning and tool holding products, as we work closely with your team to address and improve every aspect of production. For over 80 years, Seco has developed the tools, processes and services that leading manufacturers turn to for maximum performance. Whatever challenges you encounter, our team is always nearby to help you overcome them through extensive expertise and high quality products.

Seco customers can also access the latest information regarding new products, machining data, manufacturing techniques and other developments by visiting our aerospace website at [WWW.SECOTOOLS.COM/AEROSPACE](http://WWW.SECOTOOLS.COM/AEROSPACE).

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## SUPPLYING AEROSPACE

# RISING TO THE CHALLENGE

The aerospace industry faces many challenges, with a primary focus on reducing weight and increasing fuel efficiency. By 2020, the industry has committed to achieving four distinct milestones.

1. 50% reduction of CO<sub>2</sub> (carbon dioxide) emissions per passenger per kilometer
2. 50% reduction in perceived aircraft noise
3. 80% reduction in N<sub>2</sub>O (Nitrous Oxide) emissions
4. Implementation of a greener aircraft life cycle

These challenges come even as the world experiences continued growth in demand for air travel and higher aircraft build rates. Technology will play a key role in meeting these environmental goals.

Today, metallurgists, chemists and plastics engineers work constantly to develop the materials of the future. Such efforts are vital, as a substantial majority of environmental improvements in aircraft will derive from weight reduction.

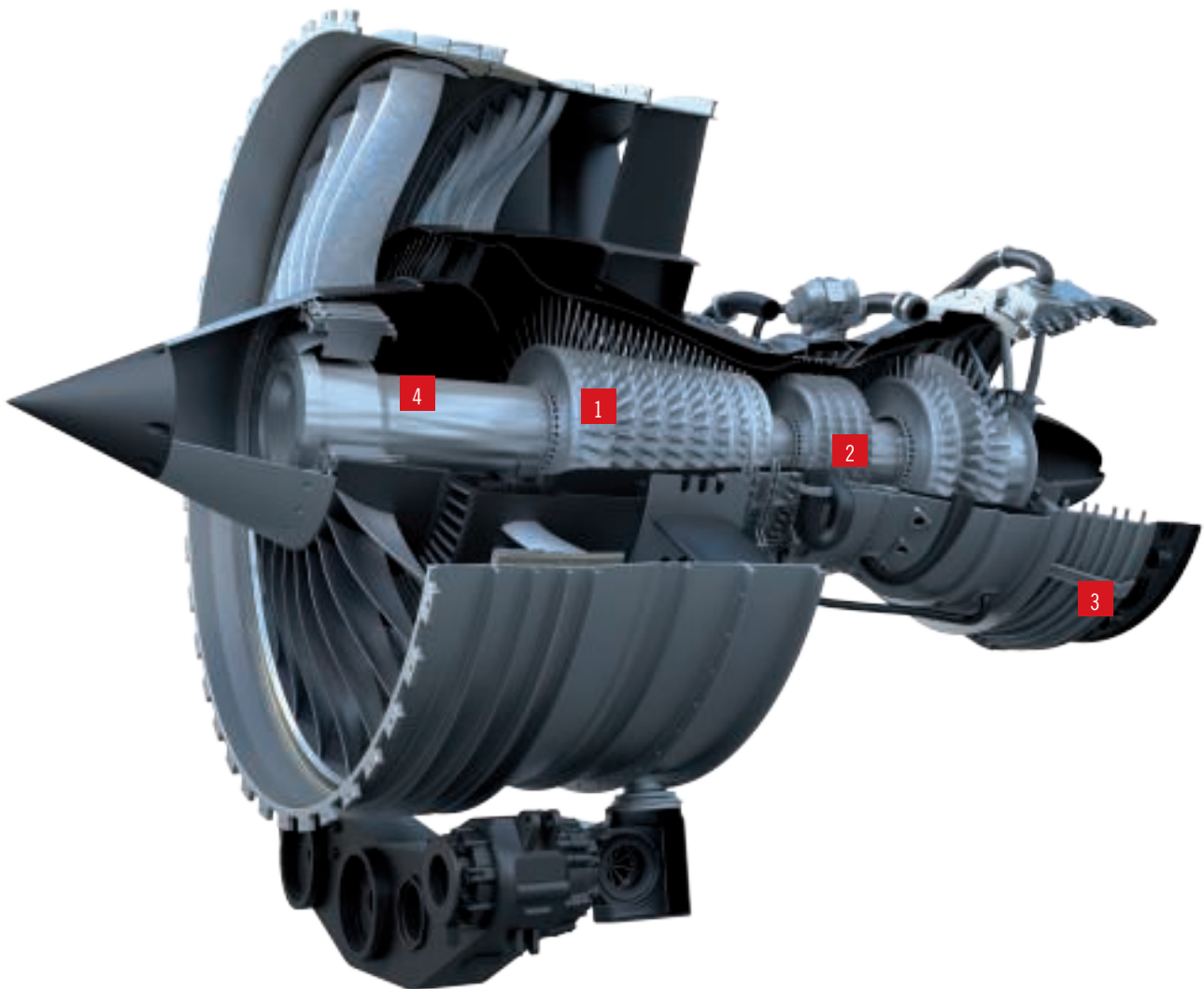
New aircraft will feature more efficient engines with more advanced components made from new lighter, stronger materials for better combustion and airflow. Airframe structures will be made of even lighter composites or materials such as aluminium lithium. Landing gear will be made from new, stronger titanium alloys. All of these developments will test manufacturers' abilities, as they adapt to working with different, more difficult materials.

At Seco, we partner with customers, research institutes, universities and other aerospace organisations to fully understand the challenges aerospace manufacturers face and develop the solutions to overcome them. Our own R&D focuses on the advanced technologies, tools, strategies and component solutions that will drive and evolve your processes.

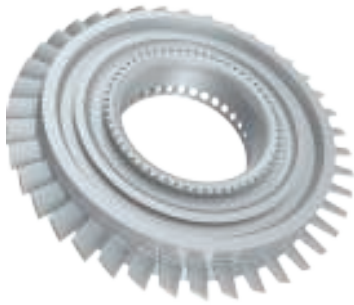
As the aerospace industry continues to innovate towards more efficient and environmentally friendly performance, Seco will be there to help you meet and overcome the resulting challenges to your operations.



# ENGINE COMPONENTS



1



### BLISKS

Also known as integrally bladed rotors, or IBRs, blisks present a variety of machining challenges due to the materials used and their complex geometries. Typically produced from titanium or heat resistant superalloys, blisks require complex production processes, impeccable quality and high levels of process stability and control. To achieve the needed results, manufacturers must integrate a mix of the latest in machine, software and cutting tool technologies.

2



### DISCS

Machined from technically advanced materials, discs are the solid core to which an engine's fan, compressor and turbine blades are attached, usually by dovetail or fir-tree root. These complex parts require a variety of demanding features, all of which must be machined to the highest possible standards. Productively producing engine discs necessitates understanding and implementing the latest and most innovative of cutting processes.

3



### CASINGS

Like most other engine components, casings are frequently machined from difficult materials, such as titanium and heat resistant superalloys. However, some varieties are produced from aluminium, stainless steels or even composites, each of which can require different tools and cutting data. Used to channel air through the engine, casings feature complex designs that present manufacturers with a host of machining challenges.

4



### SHAFTS

Responsible for transferring power from the turbine to the compressor, shafts run most of the length of the engine and are subjected to high demands during operations. As a result, materials such as high tensile steel and heat resistant superalloys are typically used in their production, increasing the challenge of effectively and efficiently machining these components.





# LANDING GEAR COMPONENTS

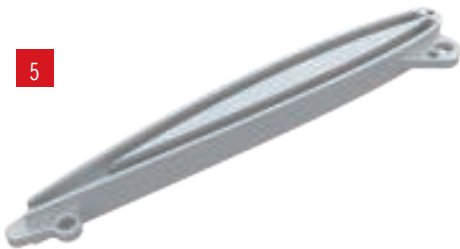


## 1. AXLE BEAMS, 2. MAIN CYLINDERS, 3. SLIDERS, 4. LINKS & BRACKETS

Used only for taking off, landing and ground maneuvers, landing gear must be as lightweight as possible to maximise fuel efficiency, while still being capable of absorbing the tremendous forces placed on it when in use. As a result, manufacturers often turn to exotic, difficult-to-machine materials for landing gear components.



# AIRFRAME COMPONENTS



5

## FLAP TRACKS

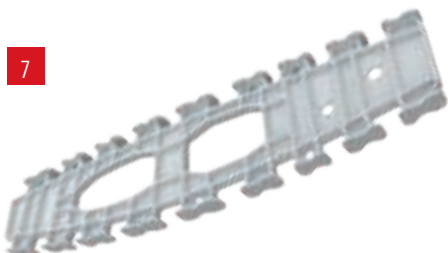
Manufactured most often from PH steels and titanium, flap tracks control the flaps located on the trailing edge of an aircraft's wings. These components often require long cycle times in difficult materials, offering the chance for substantial productivity gains through process improvements from new tooling technologies.



6

## ENGINE MOUNTS

A vital component during operation, engine mounts form the interface between the engines and wings of an aircraft. These components typically require substantial metal removal and are usually made of titanium or heat resistant superalloys. As such, robust tools capable of highly productive performance in difficult materials are a must for successfully manufacturing these parts.



7

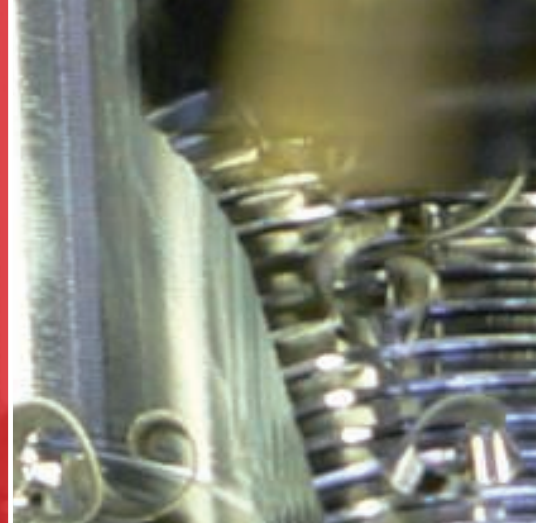
## RIBS

With an intense focus on minimising component weight, airframe ribs have traditionally been machined from aluminium. While this is still common, breakthroughs in materials technology are driving a rise in the use of aluminium lithium and composite materials. As a result, manufacturers producing these parts need solutions tailored to several types of material properties.

#### YOUR MANUFACTURING CHALLENGES:

- Controlling chip flow and maximising turning productivity
- Increasing process security and hole quality
- Maintaining tight tolerances with high accuracy
- Implementing complex machining strategies for high material removal rates on aerofoils, edges, hubs & fillets

- Creating a highly productive synergy between the machine, CAM and tooling



## MACHINING ENGINE COMPONENTS: DISCS

1



#### JETSTREAM TOOLING® WITH MDT

##### YOUR CHALLENGE:

Controlling chip flow and maximising turning productivity.

##### OUR SOLUTION:

By delivering a jet of high pressure coolant to the optimum position of the cutting edge, Jetstream Tooling® rapidly cools chips, making them brittle and easier to control. The innovative system also lifts chips from the rake face, further stabilising the machining process and allowing the use of more aggressive cutting data. Your benefits include increased tool life, higher productivity, better chip control and the quality your customers demand.

2



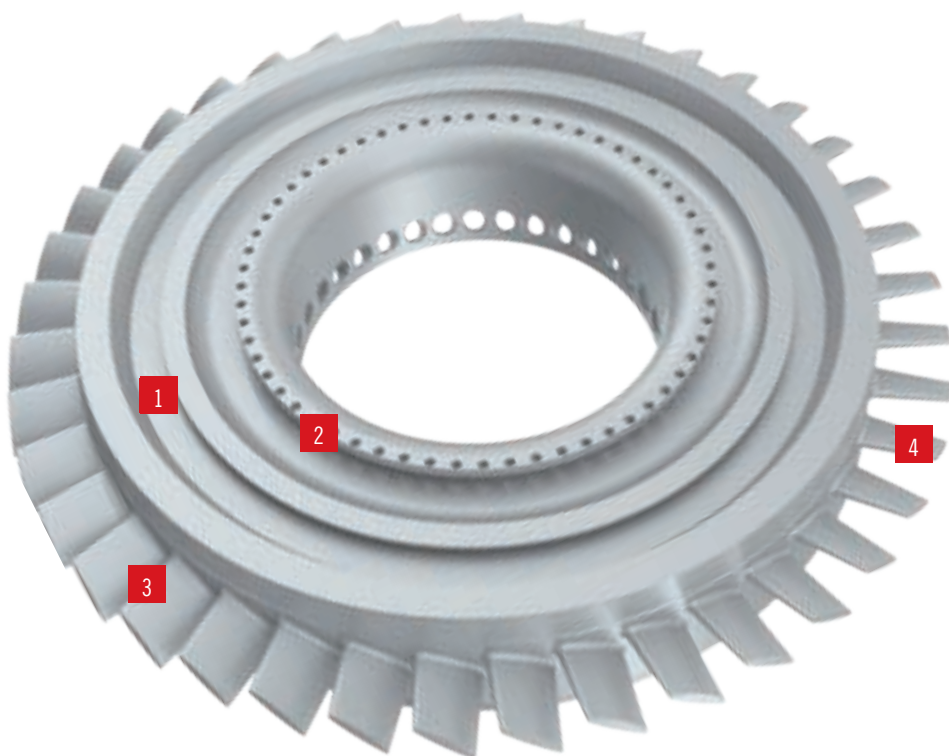
#### SECO FEEDMAX™ SOLID CARBIDE DRILLS

##### YOUR CHALLENGE:

Increasing process security and hole quality.

##### OUR SOLUTION:

Designed specifically for heat resistant superalloys and other extremely challenging materials, Seco Feedmax solid carbide drills incorporate light cutting geometries to achieve long, predictable tool life and minimise residual stress in the workpiece. Sharp, positive and strong cutting edges ensure excellent hole quality, reduced exit burrs and less deformation hardening of the material. Your benefits include consistent quality and a highly reliable and secure process.



## JABRO™ SOLID CARBIDE END MILLS

### YOUR CHALLENGE:

Maintaining tight tolerances using complex machining strategies on aerofoils, edges, hubs and fillets.

### OUR SOLUTION:

With differential pitch to reduce vibration and edge preparation to increase tool life, Seco's solid carbide end mills are available in a wide range of geometries, diameters and coatings. Incorporating these cutters with strategies such as plunge milling, Z-leveling and high feed milling provides reliable, precise results. Your benefits include optimisation of productivity and achieving the tolerances you need when finish machining aerofoils, leading and trailing edges, hubs and fillets.



## PLUNGE MILLING CUTTERS

### YOUR CHALLENGE:

Implementing complex machining strategies for high material removal rates on aerofoils, edges, hubs and fillets.

### OUR SOLUTION:

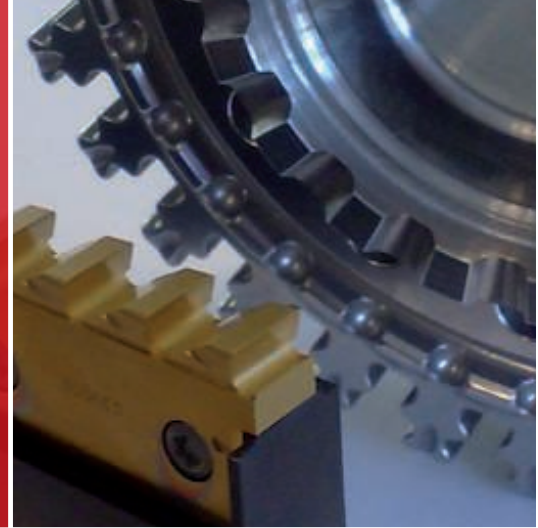
A wide variety of standard cutters for plunge milling offer excellent performance in aggressively removing material in hard-to-reach places. By directing cutting forces axially toward the spindle, plunge milling cutters keep productivity high by maintaining stability in situations with long overhangs. Your benefits include optimised efficiency and greater profitability when rough machining airfoils, leading and trailing edges, hubs and fillets.



#### YOUR MANUFACTURING CHALLENGES:

- Increasing process security and hole quality
- Maintaining tight geometric tolerance, quality and productivity
- Controlled deburring of holes, fir tree and dovetail features
- Controlling chip flow and maximising productivity

- Efficiently roughing fir tree root or dovetail forms
- Productively machining demanding fir tree root features
- Using complex production and machining strategies to achieve high levels of surface integrity free from imperfections that could develop into fractures



## MACHINING ENGINE COMPONENTS: DISCS

1



#### SECO FEEDMAX™ SOLID CARBIDE DRILLS

##### YOUR CHALLENGE:

Increasing process security and hole quality.

##### OUR SOLUTION:

Designed specifically for heat resistant superalloys and other extremely challenging materials, Seco Feedmax solid carbide drills incorporate light cutting geometries to achieve long, predictable tool life and minimise residual stress in the workpiece. Sharp, positive and strong cutting edges ensure excellent hole quality, reduced exit burrs and less deformation hardening of the material. Your benefits include consistent quality and a highly reliable and secure process.

2



#### JABRO™ SOLID CARBIDE TOOLS

##### YOUR CHALLENGE:

Maintaining tight geometric tolerance quality and productivity.

##### OUR SOLUTION:

When machining slots, scallops or weight reducing features in aero engine components our range of HPM (High Performance Tools) with specific geometries for titanium (JHP770) and heat resistant alloys (JHP780) will offer a proven solution for every task.

3



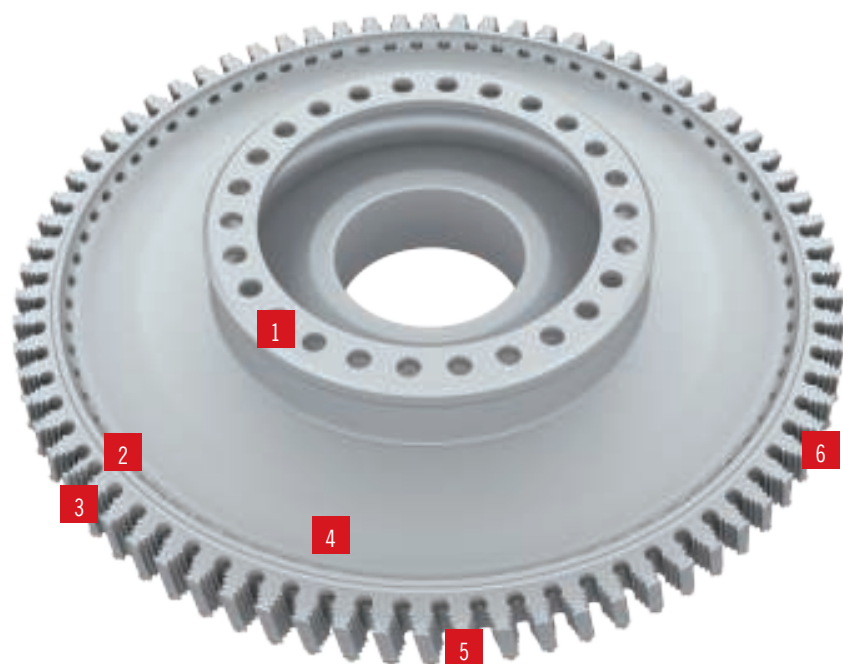
#### MECHANICAL EDGE PROFILING CUTTERS

##### YOUR CHALLENGE:

Controlled deburring of holes, fir tree and dovetail features.

##### OUR SOLUTION:

Tailored specifically to deburring operations, these tools feature profiles with radii, chamfers and chamfers with tangential radii to meet high geometric tolerances. For example these tools have been used to make significant time saving when used to replace manual deburring of dovetail and fir tree features associated with compressor discs and thus allowing the process to be automated and controlled.



## JETSTREAM TOOLING®

### YOUR CHALLENGE:

Controlling chip flow and maximising productivity.

### OUR SOLUTION:

Why Jetstream Tooling? Increased cutting data, extended tool life, improved chip control and better surface finish. Equal increased productivity. Using Jetstream Tooling® for turning complex disc profiles enables you to maximise the quality of turned features, both standard tools and custom winning solutions tools are available.

## BROACHING TOOLS

### YOUR CHALLENGE:

Efficiently roughing fir tree or dovetail forms.

### OUR SOLUTION:

The indexable carbide insert design of our unique, patented broaching tools provides incredible gains over traditional high-speed steel alternatives. With no need for regrinding and tremendous gains in cutting speeds, these cutters streamline tooling inventories and can reduce production times by up to 50%. Your benefits include immediate, dramatic cost and time savings.

## JABRO™ SOLID CARBIDE FIR TREE AND DOVETAIL TOOLS

### YOUR CHALLENGE:

Productively machining demanding fir tree and dovetail root features.

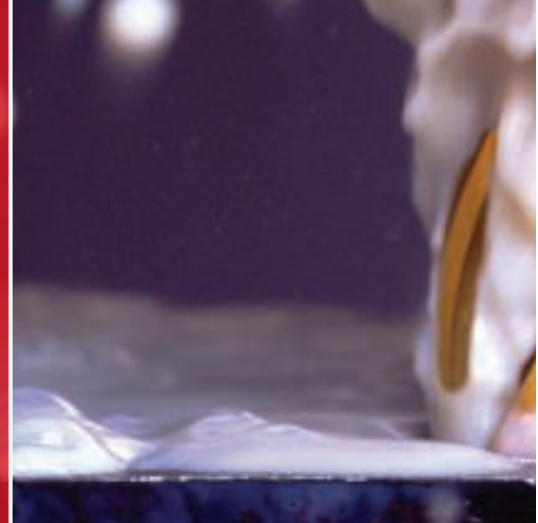
### OUR SOLUTION:

Counted among our most accurate and high tolerance cutters, Jabro™ solid carbide fir tree and dovetail tools provide extreme precision in machining one of the most challenging features found in an aerospace engine. A helical design with spiral flute improves surface finish, vibration and tool life, while the high dimensional accuracy of the cutters is verified with a tool quality certification. Your benefits include complete confidence in your process while maximising productivity.

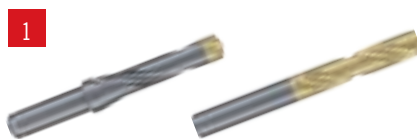
#### YOUR MANUFACTURING CHALLENGES:

- Reliably creating holes as productively as possible
- Balancing productivity, reliability and versatility
- Maintaining stability across varied turning and grooving operations
- Maximising productivity and optimising surface finish

- Maintaining superior surface finish with high productivity on parts that can have stability and clamping issues combined with long cycle times



## MACHINING ENGINE COMPONENTS: CASINGS



### SECO HOLEMAKING SOLUTIONS

#### YOUR CHALLENGE:

Reliably creating holes as productively as possible.

#### OUR SOLUTION:

By offering a wide array of highly productive holemaking solutions, we ensure a perfect fit for your unique application. From Feedmax™ solid carbide drills to Crownloc® exchangeable tip drills to Perfomax® indexable insert drills, we provide the technology to meet your goals. Your benefits include the ability to meet your customers' requirements as productively and cost effectively as possible.



### SECO PROFILE MILLING SOLUTIONS

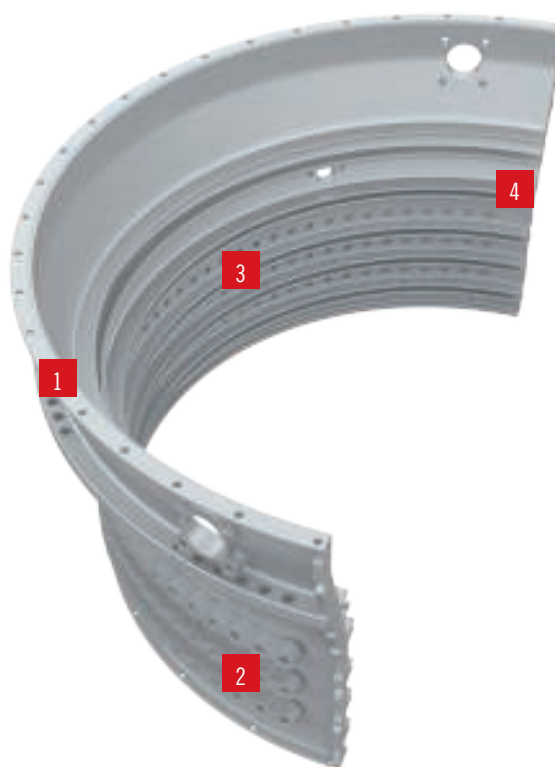
#### YOUR CHALLENGE:

Balancing productivity, reliability and versatility.

#### OUR SOLUTION:

Unstable parts, long cycle times and difficult-to-machine materials represent only a few of the challenges when profile milling an engine casing. Seco offers a broad range of solutions based on years of expertise, including round insert and high feed turn milling, slotting and profiling with helical tools, and creating detailed features with our Minimaster® end mills. Your benefits include milling cutters perfectly suited to machining engine casings.





## JETSTREAM TOOLING® WITH MDT

### YOUR CHALLENGE:

Maintaining stability across varied turning and grooving operations.

### OUR SOLUTION:

The MDT (Multi-Directional Turning) System includes holders and inserts for external radial, external axial and internal machining. Through our unique Secoloc insert clamping, this highly flexible solution can reliably be applied across turning, profiling and grooving parts with many diameters and complicated profiles and grooves. Your benefits include increasing productivity while achieving extremely reliable results with high repeatability.



## MILLING SOLUTIONS

### YOUR CHALLENGE:

Maximising productivity and optimising surface finish.

### OUR SOLUTION:

Seco Quattromill® is the perfect tool when face milling, with three insert sizes and the super positive geometry Quattromill® provides the ideal combinations when milling split cases or boss features on the outer diameter of the cases and especially when high surface finish is demanded. In addition to face milling we offer a complete range of innovative disc milling cutters for machining the spilt lines: Your benefits include access to the most comprehensive product range on the market.

#### YOUR MANUFACTURING CHALLENGES:

- Controlled deburring of holes and other features
- Reaming precise guide vane holes with perfect surface finishes
- Eliminating the potential of threading rework
- Boring high precision holes with complete repeatability

- Solving complex production challenges by skillfully combining the machine, CAM and tooling
- Finding tools that perform under difficult conditions on both solid and fabricated parts



## MACHINING ENGINE COMPONENTS: CASINGS



### MECHANICAL EDGE PROFILING CUTTERS

#### YOUR CHALLENGE:

Controlled deburring of holes and other features.

#### OUR SOLUTION:

Tailored specifically to deburring operations, these tools feature profiles with radii, chamfers and chamfers with tangential radii to meet high geometric tolerances. This eliminates the need for manual deburring and instead allows the process to be automated. Your benefits include elimination of intensive manual labour and higher productivity.



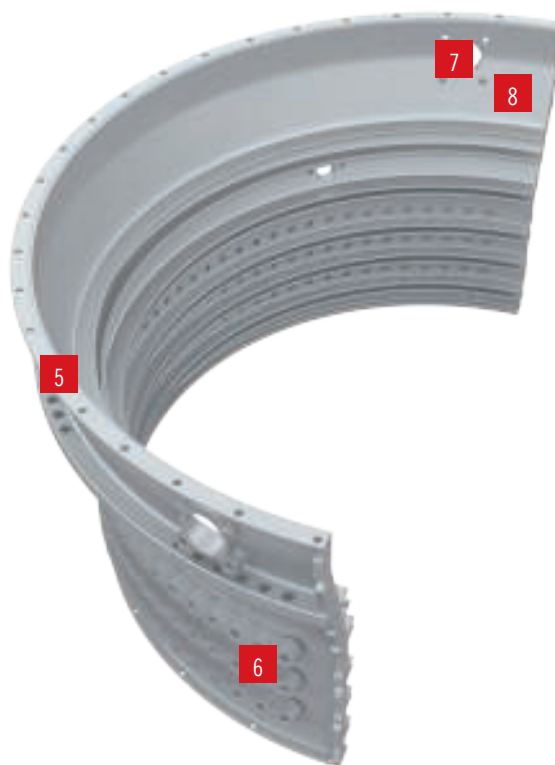
### SECO REAMING SOLUTIONS

#### YOUR CHALLENGE:

Reaming precise guide vane holes with perfect surface finishes.

#### OUR SOLUTION:

Precimaster™ provides excellent hole quality and stability. Additionally, our Nanofix™, Precifix™ and Xfix™ lines fill out our range of reaming products, guaranteeing a productive and high quality solution for holes ranging from 2.97 mm to 155 mm in diameter. Your benefits include cost reductions generated by Seco's winning solution – patented interchangeable head Precimaster™ perfect for machining guide vane holes in combustion cases.



## THREADMASTER™ THREAD MILLS

### YOUR CHALLENGE:

Eliminating the potential of threading rework.

### OUR SOLUTION:

Compared to traditional tapping, Threadmaster™ thread mills increase thread quality, raise productivity and cut cost per hole. High rigidity and vibration resistance provide stable performance and strong tool life, while incorporating of a high helix angle minimises risk when finish threading. Your benefits include less costs and elimination of the possibility of threading rework caused by broken taps.



## GRAFLEX® BORING TOOLS

### YOUR CHALLENGE:

Boring high precision holes with complete repeatability.

### OUR SOLUTION:

For both rough and finish machining, the Graflex® modular boring system simplifies the creation of a secure solution matched to your requirements. Fine balanced Libraflex® heads for accuracy when finishing or easy to set roughing. Tools and holders available to cover diameters 0.3 mm to 2.155 mm. You will always find the right combination for engine casing applications.



#### YOUR MANUFACTURING CHALLENGES:

- Controlling chip flow and maximising turning productivity
- Maximising process security and hole quality
- Controlled deburring of holes and other features
- Eliminating vibration from boring applications
- Boosting productivity during finish machining

- Finding solutions for deep bores with internal features and avoiding surface imperfections created by machining processes



# MACHINING ENGINE COMPONENTS: SHAFTS



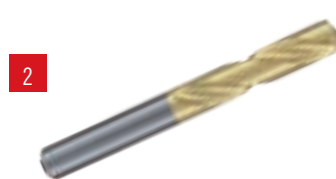
## JETSTREAM TOOLING® WITH MDT

### YOUR CHALLENGE:

Controlling chip flow and maximising turning productivity.

### OUR SOLUTION:

By delivering a jet of high pressure coolant to the optimum position of the cutting edge, Jetstream Tooling® rapidly cools chips, making them brittle and easier to control. The innovative system also lifts chips from the rake face, further stabilising the machining process and allowing the use of more aggressive cutting data. Your benefits include increased tool life, higher productivity, better chip control and the quality your customers demand.



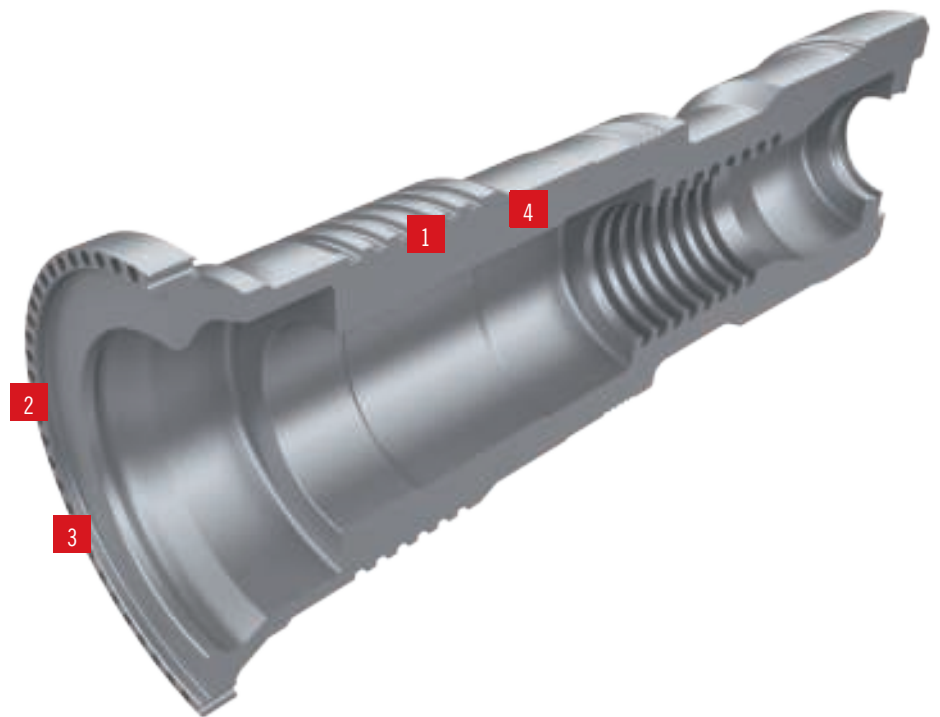
## SECO FEEDMAX™ SOLID CARBIDE DRILLS

### YOUR CHALLENGE:

Maximising process security and hole quality.

### OUR SOLUTION:

Designed specifically for heat resistant superalloys and other extremely challenging materials, Seco Feedmax solid carbide drills incorporate light cutting geometries to achieve long, predictable tool life and minimise residual stress in the workpiece. Sharp, positive and strong cutting edges ensure excellent hole quality, reduced exit burrs and less deformation hardening of the material. Your benefits include consistent quality and a highly reliable and secure process.



## MECHANICAL EDGE PROFILING CUTTERS

### YOUR CHALLENGE:

Controlled deburring of holes and other features.

### OUR SOLUTION:

Tailored specifically to deburring operations, these tools feature profiles with radii, chamfers and chamfers with tangential radii to meet high geometric tolerances. This eliminates the need for manual deburring and instead allows the process to be automated. Your benefits include elimination of intensive manual labour and higher productivity.



## SECOMAX™ CBN170

### YOUR CHALLENGE:

Boosting productivity during finish machining.

### OUR SOLUTION:

The world's first PCBN grade designed specifically for the machining of nickelbased heat resistant superalloys, Secomax CBN170 excels in your most exacting applications. Combined with Jetstream Tooling®, this unique grade offers up to eight times the cutting speed of tungsten carbide inserts (up to 400 m/min), while achieving the quality and stability you need. Your benefits include substantial increases to productivity in some of your most difficult finish machining applications.

#### YOUR MANUFACTURING CHALLENGES:

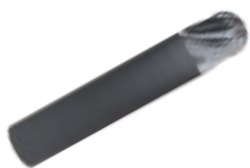
- Machining complex contours with high surface finish demands
- Getting top performance when high speed finishing
- Boring high precision holes with complete repeatability
- Creating holes as reliably and productively as possible
- Increasing process security while boosting productivity

- Reducing vibrations while boosting productivity
- Milling is the predominate activity on these parts and demands a complete package of tooling and application support to fully utilise the high level of machine tool investment



## MACHINING LANDING GEAR COMPONENTS: AXLE BEAMS AND MAIN CYLINDERS

1



### SECO JABRO™ SOLID CARBIDE

#### YOUR CHALLENGE:

High speed finishing.

#### OUR SOLUTION:

For either high tensile steels such as A300M or titanium Ti5553 we can support many application areas, specifically multi axis and copying/contouring applications at high speed which offer the greatest challenges. Seco's solution to these challenges are multi tooth ball nose tools designed with specific geometries and coatings for high speed finishing.

2



### COPY MILLING SOLUTIONS

#### YOUR CHALLENGE:

Complex contours.

#### OUR SOLUTION:

Seco Tools has a comprehensive range of round insert cutters, the most flexible tools in 3D milling. They can be used for many types of applications like circular interpolation and helical interpolation ramping, shoulder milling, slot milling, plunging and ramping. Round inserts are very strong and therefore suitable in difficult operations and materials.

3



### PLUNGE MILLING

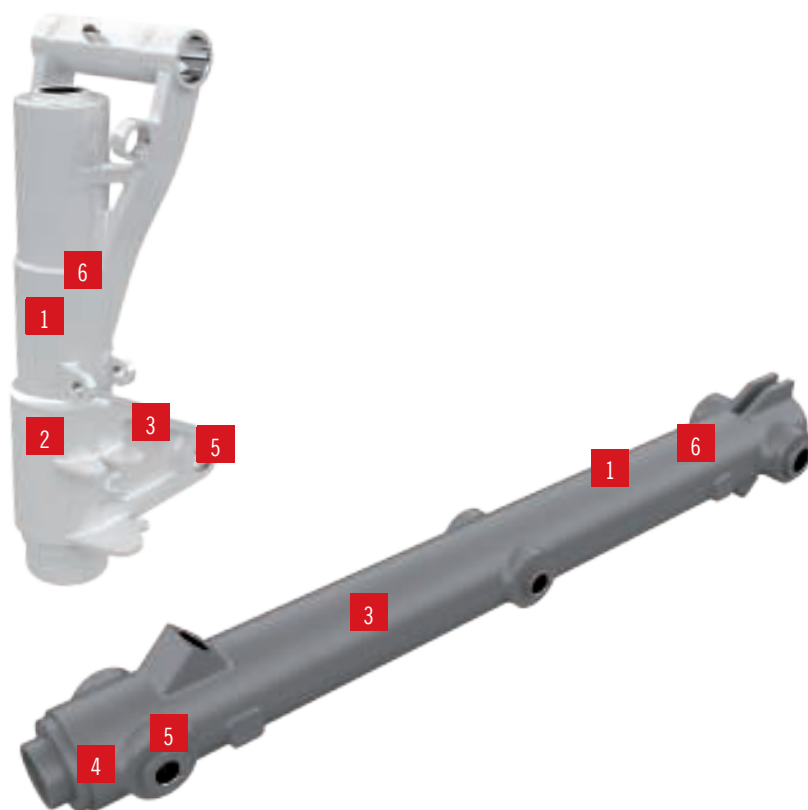
#### YOUR CHALLENGE:

Reducing vibrations and increasing productivity.

#### OUR SOLUTION:

This type of machining technique is especially efficient where conditions require an extremely long tool overhang. Combined with our unique Steadyline system you can achieve a highly productive solution. Its vibration absorber dampens and improves the dynamic stiffness of the holder with up to 4 times productivity improvement over conventional holders. Multi axis plunging is suitable for rough and finish machining where normally accessibility would result in compromise and an increase in cutting time.





## SECO GRAFLEX® BORING TOOLS

### YOUR CHALLENGE:

High precision holes time after time.

### OUR SOLUTION:

Graflex® modular boring system for roughing and finishing. Consisting of heads and tool holders that can be used securely in various landing gear applications. Fine balanced: Libraflex® heads for accuracy when finishing or easy to set roughing heads, with tool holders available in diameter 0.3 mm to 2,155 mm you will always find the right solution for you.



## HOLEMAKING SOLUTIONS

### YOUR CHALLENGE:

Productivity and reliability.

### OUR SOLUTION:

We offer a total solution when it comes to your holemaking requirements for landing gear applications from drilling high quality and high tolerance holes with solid carbide Feedmax™ drills, to drilling with replaceable crown Crownloc® drills and Perfomax® insert drills. These all provide economical and cost effective solutions. In addition we offer reaming solutions for exact tolerances and form with excellent surface finish.



## HELICAL SHOULDER MILLING WITH TURBO MILL

### YOUR CHALLENGE:

Reliability and performance.

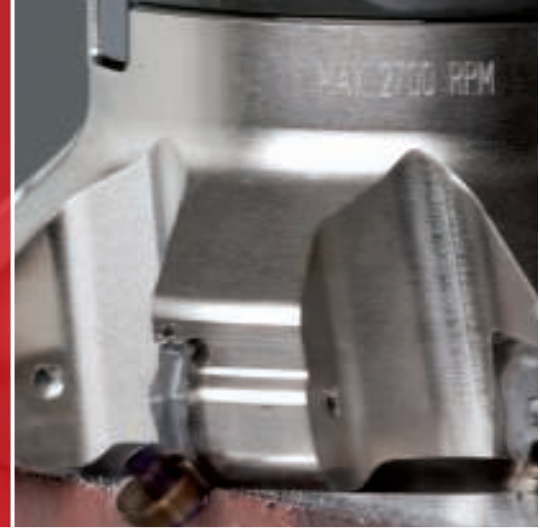
### OUR SOLUTION:

Seco's helical cutters open the door to new levels of productivity. The free cutting performance of Turbo with our strong, thick inserts and hardened steel cutter bodies can more than handle the demands of landing gear component applications. These tools are becoming industry's first choice for helical solutions in the new high strength titaniums where reliability, flexibility and performance tooling is required.

#### YOUR MANUFACTURING CHALLENGES:

- Creating holes accurately, reliably and as productively as possible
- Boring high precision holes with complete repeatability
- Attaining the best mix of productivity, cost and quality
- Reducing vibrations while boosting productivity

- Making the very best use of machine tool investment by combining advanced cutting tools with the latest machining techniques



# MACHINING LANDING GEAR COMPONENTS: SLIDERS



## HOLEMAKING SOLUTIONS

### YOUR CHALLENGE:

Creating holes accurately, reliably and as productively as possible.

### OUR SOLUTION:

We offer a total solution when it comes to your holemaking requirements for landing gear applications from drilling high quality and high tolerance holes with solid carbide Feedmax™ drills, to drilling with replaceable crown Crownloc® drills and Perfomax® insert drills. These all provide economical and cost effective solutions. In addition we offer reaming solution from Nanofix™ for the smallest holes, to Precimaster™ and Xfix™ through to Bifix™ for the larger holes all with exact tolerance and form with excellent surface finish.



## SECO GRAFLEX® BORING TOOLS

### YOUR CHALLENGE:

Boring high precision holes with complete repeatability.

### OUR SOLUTION:

Graflex® modular boring system for roughing and finishing. Consisting of heads and tool holders that can be used securely in various landing gear applications. Fine balanced: Libraflex® heads for accuracy when finishing or easy to set roughing heads, with tool holders available in diameter 0.3 mm to 2.155 mm you will always find the right solution for you.



## FACE MILL WITH DOUBLE OCTOMILL™

### YOUR CHALLENGE:

Attaining the best mix of productivity, cost and quality.

### OUR SOLUTION:

Lower cost per part, extremely economical with 16 cutting edges per insert. High quality and performance with very accurate radial and axial runout thanks to the unique cutter pockets with high speed steel (HSS) location pins, combined with ground contact surfaces of the inserts. The benefits include high quality surface finish with long tool life.

## PLUNGE MILLING

### YOUR CHALLENGE:

Reducing vibrations and increasing productivity.

### OUR SOLUTION:

This type of machining technique is especially efficient where conditions require an extremely long tool overhang. Combined with our unique Steadyline system you can achieve a highly productive solution. Its vibration absorber dampens and improves the dynamic stiffness of the holder with up to 4 times productivity improvement over conventional holders. Multi axis plunging is suitable for rough and finish machining where normally accessibility would result in compromise and an increase in cutting time.

#### YOUR MANUFACTURING CHALLENGES:

- Maximum metal removal when slotting and profiling
- Reliably creating holes as productively as possible
- Boring high precision holes with complete repeatability
- Minimising vibration in pocketing applications
- Chatter-free finishing of straight walls

- Choosing tooling and techniques suitable for deep pocketing combined with long cycle times and high metal removal rates



## MACHINING LANDING GEAR COMPONENTS: LINKS AND BRACKETS



### TURBO SQUARE SHOULDER MILLS

#### YOUR CHALLENGE:

Maximum metal removal when slotting and profiling.

#### OUR SOLUTION:

Seco's helical Turbo cutters open the door to new levels of productivity. The free cutting performance of Turbo with strong, thick inserts and hardened steel cutter bodies can more than handle the demands of slotting and profiling applications. Seco's helical Turbo10, Super and Power Turbo milling tools are the industry's first choice when reliability, flexibility and performance are required.



### SECO HOLEMAKING SOLUTIONS

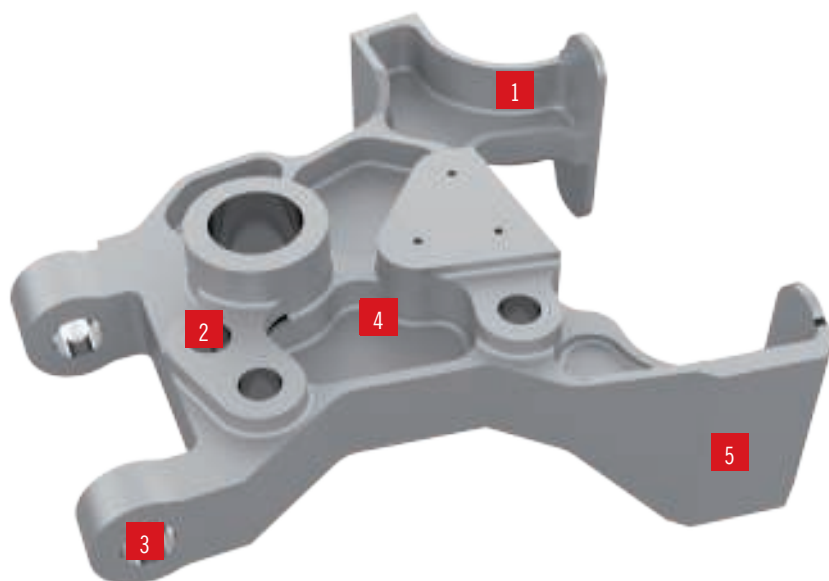
#### YOUR CHALLENGE:

Reliably creating holes as productively as possible.

#### OUR SOLUTION:

By offering a wide array of highly productive holemaking solutions, we ensure a perfect fit for your unique application. From Feedmax™ solid carbide drills to Crownloc® exchangeable tip drills to Perfomax® indexable insert drills, we provide the technology to meet your goals. Your benefits include the ability to meet your customers' requirements as productively and cost effectively as possible.





### GRAFLEX® BORING TOOLS

#### YOUR CHALLENGE:

Boring high precision holes with complete repeatability.

#### OUR SOLUTION:

Applicable to both rough and finish machining, the Graflex® modular boring system simplifies the creation of a solution matched to your requirements. Already high in rigidity and precision, Graflex® achieves incredible performance when matched with Seco fine boring heads. Your benefits include repeatable accuracy in any size of landing gear hole.



### SECO HFM SOLUTIONS

#### YOUR CHALLENGE:

Minimising vibration in pocketing applications.

#### OUR SOLUTION:

HFM (High Feed Milling) cutters are specially designed to excel in taking shallow depths of cut at extremely high feed rates. In addition to accelerating material removal, the high feed milling process reduces cutting forces and directs them axially to minimise vibration even with large overhangs. Your benefits include faster cutting cycles and elimination of vibration from your application.



### JABRO™-SOLID² JS522 LONG FLUTE FINISHING TOOL

#### YOUR CHALLENGE:

Chatter-free finishing of straight walls.

#### OUR SOLUTION:

Suitable for all materials and engineered for applications with high axial engagement of straight walls, the Jabro™-Solid² JS522 Long Flute Finishing Tool provides chatterfree finishing in a single pass. Providing excellent surface quality the cutter is available in diameters ranging from 6 mm to 32 mm with a cutting length of 5xD. Your benefits include reducing machining time and eliminating potential chatter.

#### YOUR MANUFACTURING CHALLENGES:

- Performing rough machining with Minimum Quantity Lubrication
- Maximising metal removal rates in pocketing and profile milling
- Achieving hole quality and maximising productivity
- Chatter-free finishing of straight walls
- High productivity machining



# MACHINING AIRFRAME COMPONENTS: RIBS



**JABRO™ JHP490**

#### YOUR CHALLENGE:

Performing rough machining with Minimum Quantity Lubrication.

#### OUR SOLUTION:

A high performance end mill for use in aluminium, Jabro™ JHP490 allows through-tool use of Minimum Quantity Lubrication (MQL) or soluble oil to increase quality and obtain time and cost savings. The cutter also incorporates an optimised chipbreaker profile for reduced cutting forces, smooth cutting action and high metal removal rates. Your benefits include faster cutting cycle times and less costs.



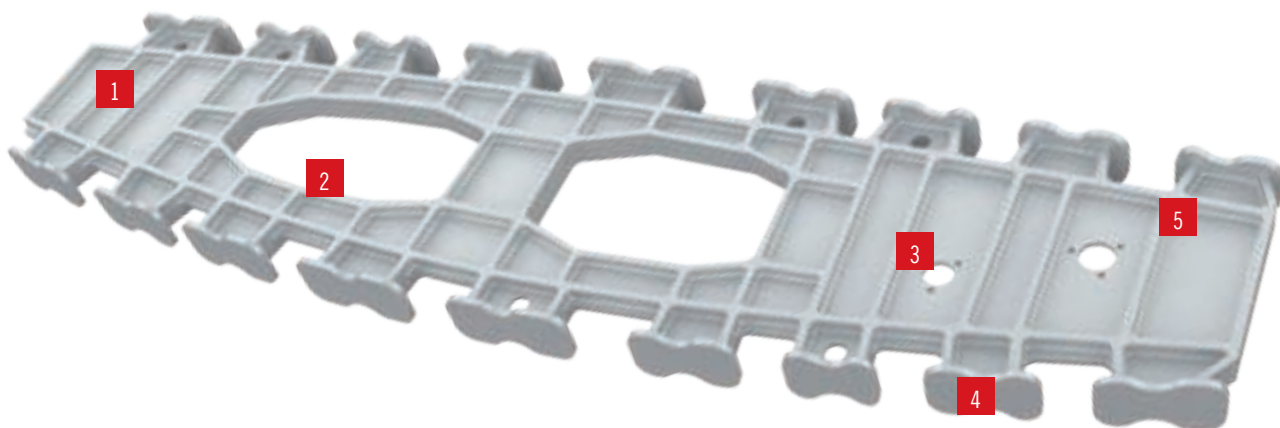
**AEROMASTER**

#### YOUR CHALLENGE:

Maximising metal removal rates in pocketing and profile milling.

#### OUR SOLUTION:

Designed to provide incredible metal removal rates in aluminium, Aeromaster combines a prebalanced cutter with positive axial rake with highrake polished inserts. This unique design enables metal removal rates of up to 3,000 cm<sup>3</sup>/min to 4,000 cm<sup>3</sup>/min. Your benefits include much faster processes that streamline your operations and cut costs.



### SECO FEEDMAX™ N-GEOMETRY

#### SOLID CARBIDE DRILLS

##### YOUR CHALLENGE:

Achieving hole quality and maximising productivity.

##### OUR SOLUTION:

A drill design with a geometry and coating specifically for aerospace aluminium and other nonferrous materials. Optimised edge preparation, conical front clearance, narrow land margins and DLC coating combine to give exceptional performance.



### JABRO™-SOLID<sup>2</sup> JS522 LONG FLUTE

#### FINISHING TOOL

##### YOUR CHALLENGE:

Chatter-free finishing of straight walls.

##### OUR SOLUTION:

Suitable for all materials and engineered for applications with high axial engagement of straight walls, the Jabro™-Solid<sup>2</sup> JS522 Long Flute Finishing Tool provides chatter free finishing in a single pass. Providing excellent surface quality the cutter is available in diameters ranging from 6 mm to 32 mm with a cutting length of 5xD. Your benefits, reducing machining time, eliminating risk of chatter and excellent surface finish.



### JABRO™- JH421 END MILLS FOR

#### ALUMINIUM MACHINING

##### YOUR CHALLENGE:

High productivity machining.

##### OUR SOLUTION:

For either roughing or finishing applications the Jabro™-JH421 provides excellent productivity combined with surface quality. The cutter is available in diameters ranging from 2 mm to 25 mm including common aerospace radii and through tool coolant available. Your benefits include reducing machining time, increased productivity and increased quality.

#### YOUR MANUFACTURING CHALLENGES:

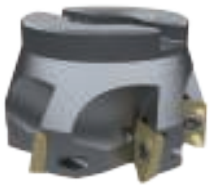
- Reducing vibrations while boosting productivity
- Chatter-free finishing of straight walls
- Increasing process security while boosting productivity
- Maintaining superior surface finishes with high productivity

- Boring high precision holes with complete repeatability (stable process)
- Reliably creating holes as productively as possible
- Choosing tools, strategies and machining data for deep pockets, chatter-free finishing, complex contours and high metal removal rate



## MACHINING AIRFRAME COMPONENTS: ENGINE MOUNTS

1



### PLUNGE MILLING CUTTERS

#### YOUR CHALLENGE:

Reducing vibrations while boosting productivity.

#### OUR SOLUTION:

A wide variety of standard cutters for multi axis plunge milling offering major reductions in machining time by aggressively removing material in hard-to-reach places. By directing cutting forces axially toward the spindle, plunge milling cutters keep productivity high by maintaining stability in situations with long overhangs. Your benefits include optimised efficiency and greater profitability when machining features that are difficult to reach.

2



### JABRO™-SOLID² JS522 LONG FLUTE FINISHING TOOL

#### YOUR CHALLENGE:

Chatter-free finishing of straight walls.

#### OUR SOLUTION:

Suitable for all materials and engineered for applications with high axial engagement of straight walls, the Jabro™-Solid² JS522 Long Flute Finishing Tool provides chatter-free finishing in a single pass. Providing excellent surface quality the cutter is available in diameters ranging from 6 mm to 32 mm with a cutting length of 5xD. Your benefits include reducing machining time and eliminating potential chatter.

3



### SQUARE SHOULDER HELICAL MILLS

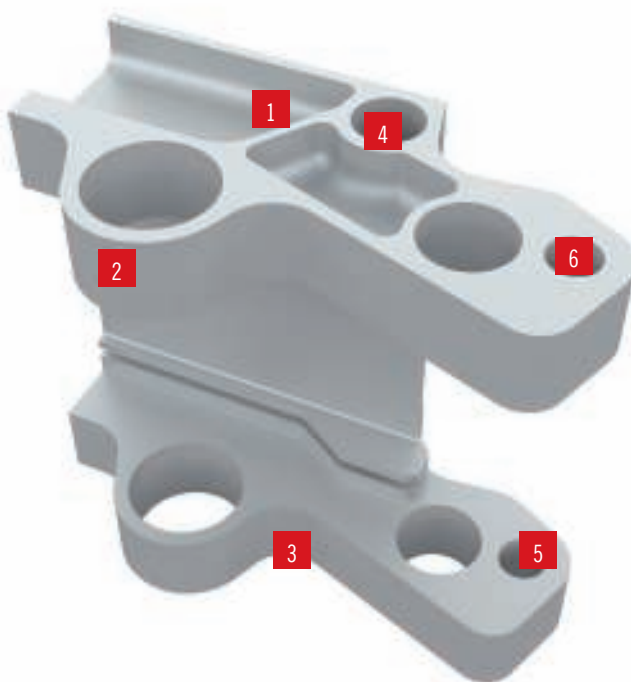
#### YOUR CHALLENGE:

Increasing process security while boosting productivity.

#### OUR SOLUTION:

In addition to our Turbo range of square shoulder mills, we also offer a range designed for maximum security when machining components with difficult to machine forged or irregular surfaces. Combined with strong, thick inserts to achieve incredibly reliable performance, these tools provide a first choice option for helical shoulder milling operations that require process security, flexibility and high precision. Your benefits include increased confidence in your applications and substantial time savings.





#### QUATTROMILL® MILLING TOOLS

##### YOUR CHALLENGE:

Boring high precision holes with complete repeatability.

##### OUR SOLUTION:

Graflex® modular boring system for roughing and finishing. Consisting of heads and tool holders that can be used securely in various engine mount applications. Fine balanced: Libraflex® heads for accuracy when finishing or easy to set roughing heads, with tool holders available in diameter 0.3 mm to 2,155 mm you will always find the right solution for you.



#### JABRO™-SOLID<sup>2</sup> JS522 LONG FLUTE FINISHING TOOL

##### YOUR CHALLENGE:

Chatter-free finishing of straight walls.

##### OUR SOLUTION:

Suitable for all materials and engineered for applications with high axial engagement of straight walls, the Jabro™-Solid<sup>2</sup> JS522 Long Flute Finishing Tool provides chatterfree finishing in a single pass. Providing excellent surface quality the cutter is available in diameters ranging from 6 mm to 32 mm with a cutting length of 5xD. Your benefits include reducing machining time and eliminating potential chatter.



#### SECO HOLEMAKING SOLUTIONS

##### YOUR CHALLENGE:

Reliably creating holes as productively as possible.

##### OUR SOLUTION:

By offering a wide array of highly productive holemaking solutions, we ensure a perfect fit for your unique application. From Feedmax™ solid carbide drills to Crownloc® exchangeable tip drills to Perfomax® indexable insert drills, we provide the technology to meet your goals. Your benefits include the ability to meet your customers' requirements as productively and cost effectively as possible.

#### YOUR MANUFACTURING CHALLENGES:

- Maintaining superior surface finishes with high productivity
- Increasing process security while boosting productivity
- Chatter-free finishing of straight walls
- Chatter-free profiling and reliable performance

- Choosing tools, strategies and machining data to cope with long cycle times, chatter-free cutting and high metal removal rates on long wall applications



## MACHINING AIRFRAME COMPONENTS: FLAP TRACKS

1



#### QUATTROMILL®

##### YOUR CHALLENGE:

Maintaining superior surface finishes with high productivity.

##### OUR SOLUTION:

A super positive geometry with up to a 35-degree effective rake angle makes Quattromill® an ideal choice for face milling of titanium and other challenging materials. A robust cutter body with a protective coating houses strong inserts with integrated anvils that protect the pocket seats. Your benefits include maintaining impeccable surface finishes while increasing the productivity and flexibility of your milling operations.

2



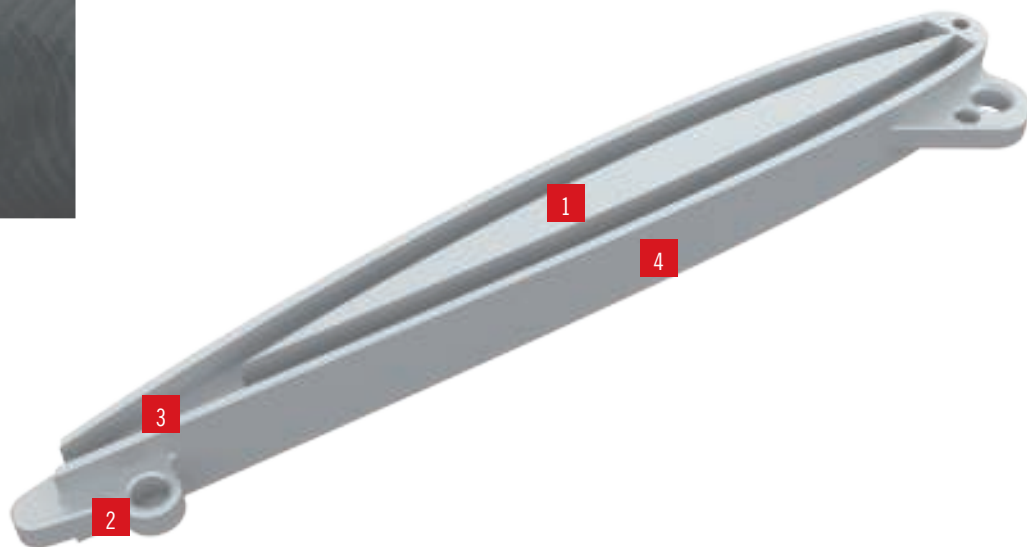
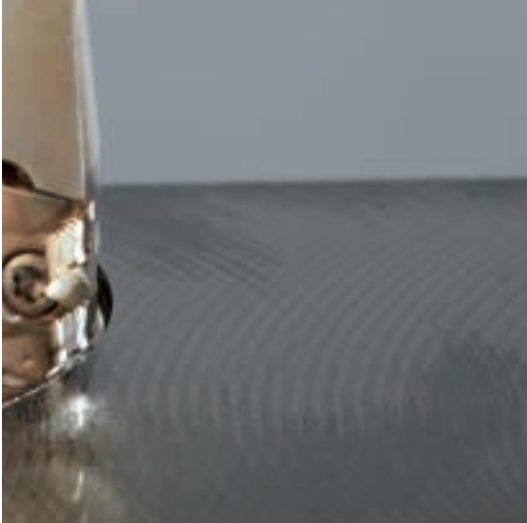
#### TURBO SQUARE SHOULDER MILLS

##### YOUR CHALLENGE:

Increasing process security while boosting productivity.

##### OUR SOLUTION:

Turbo square shoulder mills incorporate hardened steel cutter bodies and strong, thick inserts to achieve incredibly reliable performance. These tools provide a first choice option for square shoulder milling operations that require process security, flexibility and high precision. They are proven to perform exceptionally either in conventional or helical style tools machining flap track applications. Your benefits include increased confidence, stable machining process and substantial time savings.



### JABRO™-SOLID<sup>2</sup> JS522 LONG FLUTE FINISHING TOOL

#### YOUR CHALLENGE:

Chatter-free finishing of straight walls.

#### OUR SOLUTION:

Suitable for all materials and engineered for applications with high axial engagement of straight walls, the Jabro™-Solid<sup>2</sup> JS522 Long Flute Finishing Tool provides chatterfree finishing in a single pass. Providing excellent surface quality the cutter is available in diameters ranging from 6 mm to 32 mm with a cutting length of 5xD. Your benefits include reducing machining time and eliminating potential chatter.



### HELICAL PROFILE MILLING WITH TURBO MILL

#### YOUR CHALLENGE:

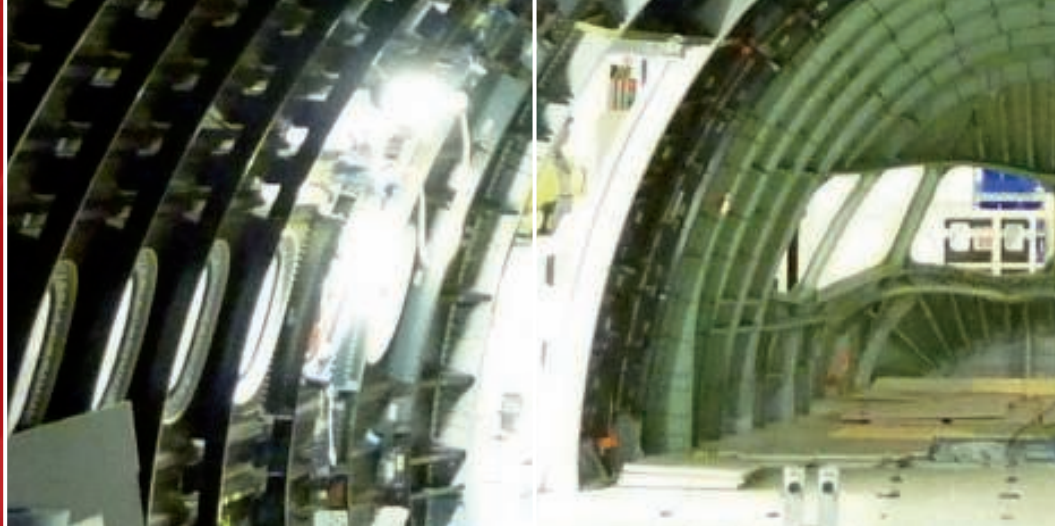
Chatter-free profiling and reliable performance.

#### OUR SOLUTION:

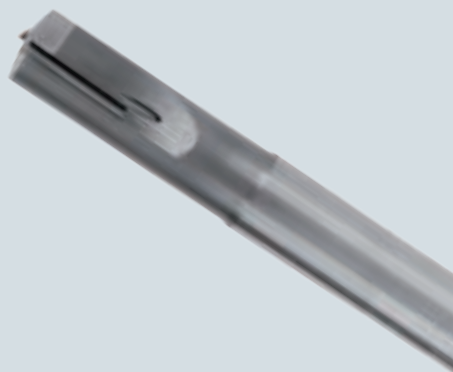
Flap Tracks require many profiling applications where cutter radial engagement ( $a_p/D$  ratio) is relatively low, below 15%  $a_e/D$ . However large axial ( $a_p$ ) engagement is often desired. Seco can offer a range of helical Turbo milling tools specifically designed for these types of applications, with optimum geometries and maximum number of flutes for light cutting, reduced forces and less chatter. These helical tools will offer reliability, flexibility and performance.

#### YOUR MANUFACTURING CHALLENGES:

- Breakout or delamination
- Fibre tear out
- Matrix material melting
- Quality demands on CFRP parts often determine machining operation strategies and methods
- Drilling of stacked materials - CFRP/Al CFRP/Ti or combination
- Short tool life when compared to metals

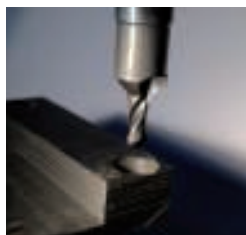


2



# MACHINING AIRFRAME COMPONENTS: COMPOSITES STRUCTURES

1



## CUSTOM-MADE PCD MILLING AND DRILLING SOLUTIONS

### YOUR CHALLENGE:

Component specific solutions using PCD tooling.

### OUR SOLUTION:

Seco PCD milling and drilling tools are also available in custom design to your requirements, we offer drilling solutions for CNC machines, power fed hand drilling equipment, orbital drilling and step drilling. For milling solutions we offer tools for surface machining and edge profiling. Your benefits include reliable and productive performance.

2



## STANDARD PCD MILLING AND DRILLING SOLUTIONS

### YOUR CHALLENGE:

Lengthening tool life while stabilising composites operations.

### OUR SOLUTION:

Seco PCD milling solutions offer incredible sharpness and excellent thermal conductivity to boost tool life and ensure maximum part quality. Additionally, our ranges of Jabro™ and Feedmax™ PCD drills can be reground to further extend tool life and reduce costs. Your benefits include reliable and productive performance when milling composites.





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3



### STANDARD JABRO™-COMPOSITES RANGE OF SOLID CARBIDE TOOLS

#### YOUR CHALLENGE:

Achieving flexibility and productivity in composites milling.

#### OUR SOLUTION:

A stringent and demanding R&D process led to the development of our Dura diamond coating for composites. A wide range of geometries incorporate this unique technology to provide highly effective composite machining from routing applications to profiling to slotting honeycomb material. Your benefits include high flexibility and productivity from tools designed specifically for these challenging materials.

4



### STANDARD DIAMOND COATED DRILLING SOLUTIONS

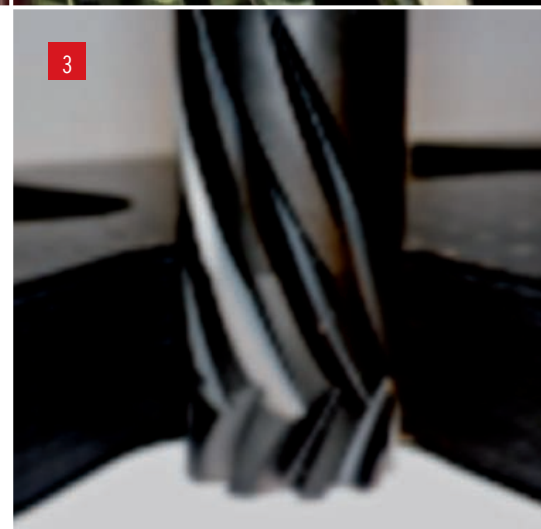
#### YOUR CHALLENGE:

Drilling productively with maximum quality.

#### OUR SOLUTION:

The geometries of our diamond coated drills minimise axial forces to reduce splintering, push-out or delamination of composite materials. A wide variety of geometries ensures solutions for applications dealing with standalone CFRPs, as well as stacked materials incorporating aluminium or titanium. Your benefits include the hole quality you need in as productive an operation as possible.

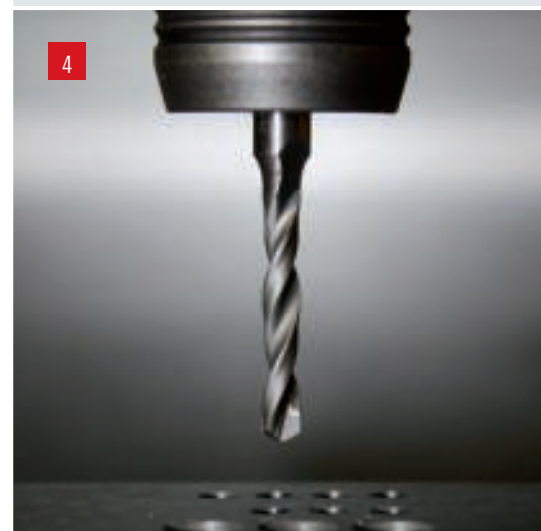
3



4



4





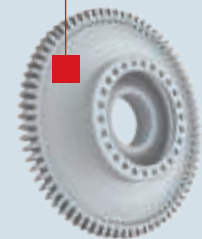
# CASE STUDIES

The true test of a potential solution is its real world application. The following examples provide a sample of the documented results Seco products and processes have achieved.

## DISC – GROOVING WITH JETSTREAM TOOLING®

Material:	Inconel 718				
Coolant:	Through coolant 80 bar				
Operation:	Finish Profile Grooving				
Criterion:	Flank Wear / Tool Life				
Fixturing:	Bespoke				
Tool:	Custom Jetstream MDT Profiling				
Insert 1:	LCMF1606M0-0600-MP, 883				
Cutting data	Metric	$v_c$	$f$	$a_p$	$a_e$
	Inch	85 m/min 279 sf/min	0.2 mm/rev 0.008" ipr	0.25 mm 0.010"	Complex Complex

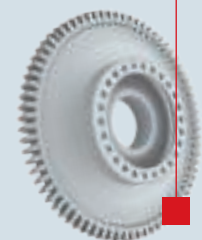
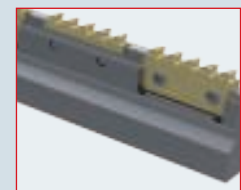
**Results** Stable process & improved quality



## DISC – ROUGH FIR TREE SLOTS WITH SECO BROACHING SOLUTIONS

Material:	Udimet 720				
Coolant:	Neat oil				
Operation:	Rough Broaching				
Criterion:	Number of slots				
Fixturing:	Bespoke				
Tool:	Custom Broach Set				
Insert 1:	Multi edge insert				
Cutting data	Metric	$v_c$	$f_z$	L	B
	Inch	15 m/min 49 sf/min	0.06 mm/tooth 0.0023" ipt	16 mm 0.630"	5 mm 0.196"

**Results** Productivity increased by 30%  
Setting time reduced by 50%



## CASE – REAMING GUIDE VANE HOLES WITH SECO PRECIMASTER™

Material:	M152				
Coolant:	Flood Coolant				
Operation:	Ream Holes				
Criterion:	Number of holes				
Fixturing:	Bespoke				
Tool:	PM08-14500-20N1				
Insert 1:	PM60-16H7-EB45				
Cutting data	Metric	$v_c$	$f$	L	D
	Inch	40 m/min 131 sf/min	0.25 mm/rev 0.0100" ipr	42 mm 1.653"	14.5 mm 0.571"

**Results** 10 times quicker than previous method





### CASE – DRILLING FLANGE HOLES WITH SECO FEEDMAX™

Material:	Inconel 718				
Coolant:	Through coolant 80 bar				
Operation:	Drill Flange Holes				
Criterion:	Number of holes				
Fixturing:	Bespoke				
Tool:	SD203A-10.0-31-10R1-M				
Insert 1:					
Cutting data		$v_c$	$f$	$L$	$D$
	Metric	31 m/min	0.076 mm/rev	10 mm	6.35 mm
	Inch	100 sf/min	0.003" ipr	0.125"	0.3937"

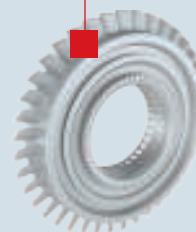
**Results** Minimum exit burr 25% more tool life than competitor



### BLISK – ROUGH PLUNGING BLISK AEROFOILS

Material:	Ti6Al-4V				
Coolant:	Through coolant 70 bar 10% emulsion				
Operation:	Plunge Aerofoil				
Criterion:	Flank Wear				
Fixturing:	Bespoke				
Tool:	R217.79 -2532.3-12A				
Insert 1:	SCET 120612T-M14 F40M				
Cutting data		$v_c$	$f_z$	$a_p$	$a_r$
	Metric	45 m/min	0.2 mm/tooth	30 mm	8 mm
	Inch	147 sf/min	0.008" ipt	1.181"	0.315"

**Results** Stable and reliable process



### MAIN CYLINDER – ROUGH PROFILE MILLING TI5553 WITH SECO HELICAL CUTTERS

Material:	Ti5553				
Coolant:	Through coolant 50 bar				
Operation:	Helical Profile Milling				
Criterion:	Flank Wear				
Fixturing:	Bespoke				
Tool:	R220.69-00080-062-18.5A				
Insert 1:	XOMX180616R-M10 T350M				
Cutting data		$v_c$	$f_z$	$a_p$	$a_e$
	Metric	30 m/min	0.1 mm/tooth	25 mm	10 mm
	Inch	98 sf/min	0.0039" ipt	0.984"	0.393"

**Results** 2.4 ipm / 56.5 mm/min feed rate, 100 mins tool life







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# CASE STUDIES

## LINK – FINISH BORING WITH SECO EPB® BORING HEADS

Material:	Ti6Al-4V				
Coolant:	Through coolant 80 bar				
Operation:	Finish Bore				
Criterion:	Surface Finish/Tool Life				
Fixturing:	Tombstone				
Tool:	A780 60				
Insert 1:	CCMT 09T304 F1 890				
Cutting data		$v_c$	$f$	$a_p$	$a_r$
	Metric	60 m/min	0.15 mm/rev	0.5 mm	50 mm
	Inch	197 sf/min	0.006" ipr	0.0196"	1.968"

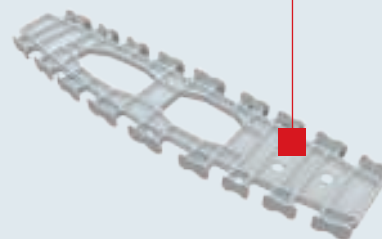
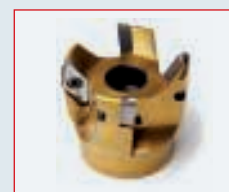
**Results** Constant hole quality to the required specification



## WING RIB – ROUGH MILLING WITH SECO AEROMASTER

Material:	Aluminium				
Coolant:	Through coolant 70 bar				
Operation:	Rough Mill				
Criterion:	Tool Life / cm³/min				
Fixturing:	Bespoke				
Tool:	R220.97-0050-V22.3A				
Insert 1:	VPGX 220631EN-E10 H25				
Cutting data		$v_c$	$f_z$	$a_p$	$a_e$
	Metric	864 m/min	0.28 mm/tooth	7.75 mm	50 mm
	Inch	2835 sf/min	0.011" ipt	0.305"	1.968"

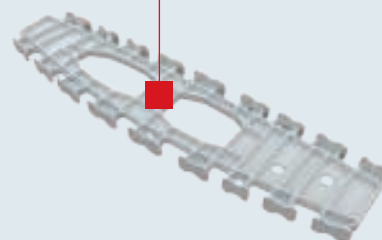
**Results** 182 ipm / 4625 mm/min  
Qw= 1,790 cm³/min



## WING RIB – ROUGH MILLING CAVITY WITH SECO JABRO™ JHP490 AND MQL

Material:	Aluminium				
Coolant:	MQL				
Operation:	Rough Pocket Mill				
Criterion:	Tool Life / cm³/min				
Fixturing:	Bespoke				
Tool:	490V200R200Z3A-MEGA-T				
Insert 1:					
Cutting data		$v_c$	$f_z$	$a_p$	$a_e$
	Metric	1700 m/min	0.16 mm/tooth	10 mm	16 mm
	Inch	5578 sf/min	0.006" ipt	0.397"	0.630"

**Results** 3 Flute, Internal through coolant suitable for MQL,  
535 ipm 13528 mm/min, Qw= 1,300 cm³/min





### FLAP TRACK – FINISH PROFILE MILLING WITH SECO JABRO™ JS522 LONG FLUTE FINISHER

Material: Ti-10V-2Fe-3Al

Coolant: Flood Coolant

Operation: Finish Profile Milling

Criterion: Tool Life Surface Quality

Fixturing: Bespoke

Tool: Solid Carbide Long Flute Finisher

Insert 1:

Cutting data		$v_c$	$f_z$	$a_p$	$a_e$
	Metric	90 m/min	0.25 mm/tooth	80 mm	0.4 mm
	Inch	295 sf/min	0.0098" ipt	3.15"	0.016"

**Results** 20 mm diameter 2 flute R2.4 mm, 28.2 ipm/716 mm/min



### FLAP TRACK – ROUGH PROFILE MILLING WITH SECO HELICAL MILLING CUTTER

Material: Ti6Al-4V

Coolant: Flood Coolant

Operation: Helical Profile Milling

Criterion: Tool Life / CM3/min

Fixturing: Bespoke

Tool: R217.69-02.00.0X-076-12.5A

Insert 1:

Cutting data		$v_c$	$f_z$	$a_p$	$a_e$
	Metric	30 m/min	0.08 mm/tooth	76 mm	15 mm
	Inch	98 sf/min	0.0031" ipt	3.000"	0.600"

**Results** 2" diameter K=5 flutes 3.09 ipm/78 mm/min



### STRINGER – DRILL CFRP WITH SECO DIAMOND COATED DRILL

Material: T2HEH25

Coolant: External Water

Operation: Drill

Criterion: Number of holes

Fixturing: Vacuum

Tool: 3.2 mm Diamond Coated Drill

Insert 1:

Cutting data		$v_c$	$f$	L	D
	Metric	80 m/min	0.01mm/rev	5 mm	3,2 mm
	Inch	262 sf/min	4" ipt	0.196"	0.126"

**Results** >500 holes



### STRUCTURAL PART – PROFILE MILLING CFRP WITH SECO JABRO™ JC840 DIAMOND COATED MILLS

Material: CFRP

Coolant: External Coolant

Operation: Finish Profile

Criterion: Tool Life

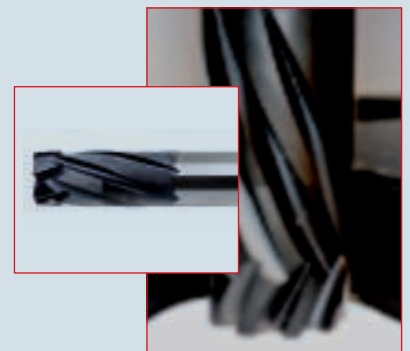
Fixturing: Vacuum

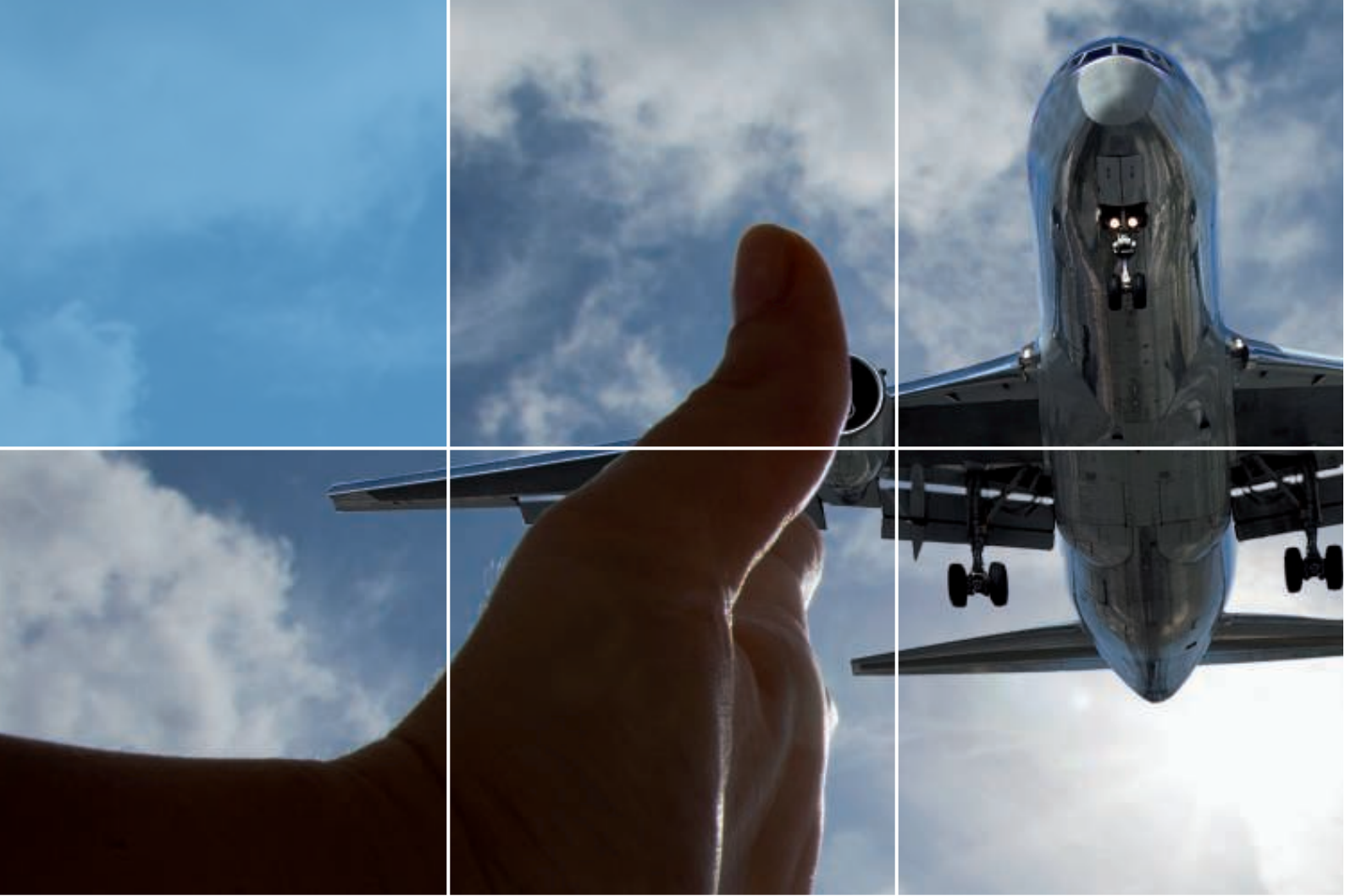
Tool: 10 mm dia Seco Jabro™ JC840

Insert 1:

Cutting data		$v_c$	$v_f$	$a_p$	$a_e$
	Metric	315 m/min	1651 mm/min	12 mm	2 mm
	Inch	1030 sf/min	65" ipt	0.472"	0.079"

**Results** >50 minutes tool life  
no delaminations - improved surface quality





**SOLUTIONS MADE FOR YOU**

# SECO'S ENGINEERING SERVICES

When striving to perfect a manufacturing process, having the right tooling partner is critical. Seco provides an extensive unique engineering service, providing full applications support and the necessary expertise to understand your productivity requirement and deliver a winning solution.

## **NETWORK OF APPLICATION EXPERTS**

Seco offers through their **STRATEGIC ENGINEERING GROUP** a global support network, consisting of international component specialists having an in-depth knowledge and understanding of the relevant industry segment. Together with locally based Seco application experts, this team ensures that you get the very best support to the component you are machining.



### INTEGRATED ENGINEERING SUPPORT

Seco's **COMPONENT ENGINEERED TOOLING (CET)** offers a comprehensive approach to process design and optimisation that ensures you achieve the highest levels of productivity, efficiency and cost effectiveness. Specialising in project management from conception to completion, the globally networked CET teams work together with our customers, and can integrate relevant representatives from providers of complementary equipment, such as machine tools, workholding and automation systems.

### DOCUMENTED PROCESS OPTIMISATION

We can assist you with current process evaluation and optimisation using the Seco **PRODUCTIVITY AND COST ANALYSIS SOFTWARE (PCA)**. This tool allows us to benchmark existing processes, documenting them against our proposal for potential improvements. PCA can be fully scaled to meet your unique needs, from assessing a single machining application to evaluating workflows throughout your facility.

### TAILOR-MADE SOLUTIONS

Seco will ensure that you always get the ultimate tooling solution best suited to your individual requirement, whether it is for standard tooling products or tailor-made solutions. Seco **CUSTOM TOOLING** offers complete support to you in these situations, analysing your application and developing a unique solution around it. With 19 state-of-the-art production facilities worldwide, Seco Custom Tooling is always available to make your challenge our priority.



**DELIVERING PERSONAL COMMITMENT**

# SECO'S BUSINESS SERVICES

## **100% RELIANCE**

Seco is fully committed to constantly improving to set new standards in **QUALITY ASSURANCE** as is evident in our global ISO 9001 certification. We rigorously evaluate our processes to ensure that every product we produce is capable of meeting and exceeding our customers' expectations. Our total commitment to quality is evident in the level of documentation we provide which meets the vigorous requirements of traceability set by our customers. When you partner with Seco, quality becomes a constant you can count on.





### LONG-TERM SUSTAINABILITY

Seco has established and maintains a used carbide **RECYCLING PROGRAMME**; with a commitment to minimising our environmental footprint and conserving non-renewable materials. All aspects of this programme operate within the principles of our ISO 14001 certification, and we make it easy for you to participate. When you recycle used carbide, you not only positively impact the environment, you also recoup a portion of your original ex-pense and help us minimise the cost of tools in the future.



### KEEPING THE CUTTING EDGE

**TOOL RECONDITIONING** is critical to maintain the quality standards required on your workpiece but often, when a tool is removed from use as they show signs of wear, this means discarding an entire cutter when only a small portion of it has been worn. Seco's tool reconditioning service eliminates this potential waste by applying advanced re-grinding and re-coat-ing processes to bring a tool's geometry, edge preparation and coating back to its original specifications.

### INVENTORY MANAGEMENT

Using **SECO POINT - INVENTORY MANAGEMENT** is made simple and efficient. This can be achieved through our user-friendly, point-of-use tool dispensers, tool consumption and inventory levels are tracked and monitored. Inventory replenishment can be automated and you receive reports that make it easy to identify where consumption can be reduced.





**BUILDING EXPERTISE IN OUR**

# GLOBAL COMPETENCE CENTRES

## **SECO GLOBAL TECHNICAL CENTRES**

Seco's Technical Centres are used to engage with our existing and potential customers to facilitate the transfer of expertise and knowledge, for product introduction, industry specific events and engineer customer specific solutions. In addition, Seco representatives from diverse nations gather to share information and discuss winning solutions developed in their home markets, working together to ensure that we understand and are prepared for the trends and challenges you face.



#### **SECO TECHNICAL EDUCATION PROGRAMME (STEP)**

Available at our global technical centres or on-site at your own facility, Seco STEP provides training courses on every aspect of metal cutting, at every level of expertise. Whether instructing your apprentices on the basics of cutting processes or helping your experts stay abreast of the latest technological innovations, Seco STEP is an invaluable resource in maximising workforce knowledge.

#### **SECO AEROSPACE WEBSITE**

As part of our commitment to aerospace manufacturers, Seco developed a comprehensive web resource dedicated to the industry. Featuring a wide variety of video and written content, the website provides information on current trends, process innovations, tool data and documented application successes. The user-friendly site incorporates an interactive aerospace model to easily obtain data relevant to machining specific components. To learn more, visit [www.secotools.com/aerospace](http://www.secotools.com/aerospace).

Scan this code to see more.  
[www.secotools.com/aerospace](http://www.secotools.com/aerospace)



#### **SECO CUSTOMER ZONE & ONLINE STORE**

To achieve an even greater level of personal interaction with aerospace manufacturers, we provide you with access to the Seco Customer Zone - [www.secotools.com/customerzone](http://www.secotools.com/customerzone). This unique web tool provides a wealth of content tailored to your specific needs. From technical applications and product information to interactive training and online ordering. At Seco, we believe that you should always be able to place and monitor the status of orders, regardless of your location or the date or time. The Seco Online Store allows you to research technical information, check product availability, purchase tooling and follow the status of your orders.



**SECO TOOLS AB**  
**SE-737 82 FAGERSTA, SWEDEN**  
**TEL. +46 223 400 00**  
**WWW.SECOTOOLS.COM**

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