EXPERTISE IN AEROSPACE APPLICATIONS

Achieve ambitious goals with ease.
Any discussion on machining in the aerospace industry inevitably involves high-tech solutions and innovations. This is because the ability to machine new materials with a high level of process reliability and precision is not the only thing that matters – the development of technically and economically viable solutions is of equal importance. With Walter’s Engineering Kompetenz, you can rest assured that innovative product ideas can be developed into competitive series-production solutions. Walter offers you the most comprehensive range of metal cutting tools for metal and composite materials available from a single source global supplier. Flexible machining solutions for the aerospace industry that set benchmarks, whether for turning, drilling, threading or milling, with the highest possible levels of productivity and process reliability – from technical support through to tool management – regardless of the batch size or material.
Turbine housings are designed for maximum stability. They are therefore manufactured using materials such as Inconel, titanium alloys or Waspaloy. Nickel-based alloys in particular are very difficult to machine due to their high toughness and temperature stability. In addition, it must be ensured that finishing work does not cause any structural changes or damage to the edge zones. Multi-axis turn/mill centres and vertical turret lathes are primarily used for machining these materials. Our turning, milling, drilling and threading tools enable you to machine engine housings with maximum efficiency, precision and process reliability.

**ENGINE HOUSING**

**Nickel-based alloy**

YOUR APPLICATION
Roughing housing mating faces

OUR SOLUTION
Walter BLAXX M3024 heptagon face milling cutter

- 14 cutting edges per indexable insert
- Stable, negative indexable inserts
- Optimum support face and high feed per tooth thanks to solid carbide shim
- High cutting depth
- Powered by Tiger-tex® Silver

BENEFITS FOR YOU
Extremely reliable and, above all, cost-efficient tool with high stability and process reliability.

YOUR APPLICATION
Roughing external surfaces

OUR SOLUTION
Walter Cut turning toolholder with precision cooling

- CNGN207 ceramic insert
- Rake face cooling for ideal surface quality
- Extremely high cutting speeds

BENEFITS FOR YOU
Can be used universally with high machining speed and long tool life. Perfect surface quality thanks to high stability and optimum cooling in the cutting zone.

YOUR APPLICATION
Thread tapping the mating face

OUR SOLUTION
Walter Prototyp Prototex® TiNi Plus

- Innovative hard material coating and stable cutting edges
- Special geometry for machining ISO S alloys with emulsion
- High flank clearance angle reduces friction in materials that tend to cause jamming
- Wear-resistant, titanium-free ACN coating prevents weld formations

BENEFITS FOR YOU
Flexible machining of nickel and titanium alloys with just one tool. Long tool life and high process reliability due to tool stability.

YOUR APPLICATION
Drilling the connecting bores

OUR SOLUTION
Walter Titex X·treme Plus

- Wear-resistant DPL coating
- Stable main cutting edge for maximum tool life and process reliability

BENEFITS FOR YOU
Drilling and reaming tool for universal use, guaranteeing the best possible surface quality on the workpiece thanks to high cutting data.
TURBINE DISC
Nickel-based alloy

Turbine discs are engine components manufactured from titanium 64 or heat-resistant high-temperature alloys such as Inconel 738 and Udimet 720. These complex workpieces with chambers and grooves are rarely easily accessible. For this reason, our aerospace specialists develop individual machining solutions according to the shape of the component. Our focus is on ensuring that implementation of these solutions is cost-effective and reliable – which is where our cutting tools and processes can prove their worth. This enables you to carry out extremely cost-effective production, even under unfavourable conditions.

YOUR APPLICATION
HSC roughing disc contours
OUR SOLUTION
Walter Turn with claw clamping and ceramic indexable insert

- Ceramic substrate for machining nickel-based alloys
- Indexable insert geometry with stable design, adapted for nickel-based alloys

BENEFITS FOR YOU
Long tool life and high cutting speed when machining nickel-based alloys.

YOUR APPLICATION
HSC milling of turbine blade grooves
OUR SOLUTION
Carbide body end mill with ceramic cutting head

- High stability and long tool life
- Ceramic head fused onto carbide shank
- Edge geometry designed for nickel-based alloy
- Also suitable for plunge milling

BENEFITS FOR YOU
High stability and a metal removal rate five times higher than for conventional carbide solutions thanks to high cutting speed using “High Speed Cutting” (HSC) parameters.

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YOUR APPLICATION
Contour turning of the disc profile
OUR SOLUTION
Walter Cut Capto™

- Tiger·tec® PVD coating
- Versatility thanks to diverse geometries
- Special solutions for modules and inserts

BENEFITS FOR YOU
Flexible grooving system for grooving and parting off, recessing and longitudinal turning – with indexable inserts that guarantee maximum wear and temperature resistance.

YOUR APPLICATION
Roughing and finish milling of blade root profiles
OUR SOLUTION
Walter Prototyp profile groove milling cutter

- Milling to closely match the required profile
- TiAlN coating

BENEFITS FOR YOU
High accuracy and custom design to match customer specifications so that the tool reproduces the profile required in each case.
Door frame areas refer to areas in the aircraft fuselage that surround cargo doors and passenger doors. These components are important for safety, and must compensate for the structural weaknesses created as a result of openings in the aircraft fuselage. For this reason, these frames not only need to be precisely manufactured, but also must not warp, even under heavy load. They are therefore mainly made of titanium. In order to prevent crack propagation, the titanium is beta-annealed, which significantly increases tool wear. The frames are also designed in lengths of up to 4 m and incorporate reinforcement bars, all requiring high machining volumes without causing the component to warp. The primary focus is therefore on process reliability.

**YOUR APPLICATION**
Dynamic milling of titanium structures (High Performance Cutting)

**OUR SOLUTION**
Ti40 high-performance milling cutter

- Solid carbide tool for full slotting, dynamic milling, semi-finishing and finishing operations
- All-rounder with five cutting edges
- Microgeometry with cylindrical stabilising land
- New PVD coating technology

**BENEFITS FOR YOU**
Higher productivity for roughing, semi-finishing, finishing and dynamic high-feed milling. 50% longer tool life compared to the previous aluminium chromium nitride solution.

**YOUR APPLICATION**
Finishing pocket bases and walls (High Performance Cutting)

**OUR SOLUTION**
Ti45 high-performance milling cutter

- New PVD coating technology
- Long reach for machining deep pockets
- Finishing with close pitch options

**BENEFITS FOR YOU**
Short machining times when finishing with the highest possible tool life thanks to new PVD coating. 50% longer tool life compared to the previous aluminium chromium nitride solution.

**YOUR APPLICATION**
Drilling CFRP rivet holes (carbon fibre reinforced plastic)

**OUR SOLUTION**
Walter Titex AF1D twist drill

- Self-centring AF1D geometry
- Diamond coating for long tool life
- Specially designed for carbon fibre composite materials
- Usable in CNC systems and drill feed units

**BENEFITS FOR YOU**
Perfect for drilling in unidirectional and multidirectional carbon fibre composite materials. Even with drill feed units, the geometry provides excellent roundness and dimensional accuracy.

**YOUR APPLICATION**
Drilling stacks

**OUR SOLUTION**
Walter Titex AFT4A solid carbide drill

- Designed for Automatic Drilling Units (ADU’s) and CNC systems
- Stable design with large coolant-through channels
- Smooth, heat-resistant aluminium chromium nitride coating

**BENEFITS FOR YOU**
Specially developed for use with Automatic Drilling Units. Polished flutes and the heat-resistant aluminium chromium nitride (ACN) coating ensure optimal chip evacuation.

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**YOUR APPLICATION**
Roughing (slot, corner, profile and pocket milling) of titanium alloys

**OUR SOLUTION**
Walter BLAXX M3255 porcupine milling cutter

**BENEFITS FOR YOU**
- High level of process reliability thanks to excellent chip removal, optimum chip space and stable design. Positive cutting characteristics thanks to soft-cutting geometry – and short machining times thanks to the maximum number of teeth and the highest possible metal removal rate. High cost efficiency thanks to four or two cutting edges per indexable insert.

**YOUR APPLICATION**
Rough milling and semi-finishing of pockets generating high chip volumes

**OUR SOLUTION**
Walter M2131 ramping milling cutter

**BENEFITS FOR YOU**
- High level of concentricity and process reliability even at maximum speeds thanks to centrifugal force protection. Maximum machining volumes and tool life thanks to minimum formation of workpiece material build up on the cutting edge.
LANDING GEAR MOUNTS

Titanium alloy

Mainly consist of titanium alloys. Machining titanium elements with numerous 3-axis and 5-axis pockets, and of the landing gear. These are solid forged components connected by a shock absorber in conjunction with the main cylinder. They connect the wing and the landing gear and act as a structure above the landing gear. These elements are crucial for ensuring process reliability. Up to 100 percent longer tool life thanks to the highest possible metal removal rate. Universal system inserts with four cutting edges and the highest possible metal removal rate.

BENEFITS FOR YOU

– Face milling cutter with a 15° approach angle facilitates the choice of geometry
– Three sizes
– New PVD coating technology

OUR SOLUTION

ConeFit Flash

YOUR APPLICATION

– Ideal for long tool projections
– Special microgeometry for high-feed milling
– Internal coolant supply
– Four cutting edges

Walter Prototyp HPC Al30 close pitch cutter

YOUR APPLICATION

– New PVD coating technology
– Minimal deflection up to a length of 7 x D
– For semi-finishing and finishing operations
– Optimised ConeFit wall finishing tool with a large radius at the rear for step-free wall finishing operations
– High concentricity

BENEFITS FOR YOU

– New PVD coating technology
– New design for ideal transitions when carrying out base face finish machining
– Flexible ConeFit changeable head system: ConeFit with maximum achievable head system: ConeFit with a large radius at the rear for step-free wall finishing operations
– Internal coolant supply – also suitable for MQL
– Optimised cutting edge micro-geometry
– Transition radius on the circumference
– Four cutting edges – differential pitch for MQL

Walter Prototyp HPC Al38

YOUR APPLICATION

– New PVD coating technology
– Very high metal removal rates on single and multiple components

Walter Prototyp HPC Al38 close pitch cutter

YOUR APPLICATION

– New PVD coating technology
– Very high metal removal rates on single and multiple components

Walter Prototyp MB 265 Supreme

YOUR APPLICATION

– Centre cutting edge for reliable roughing
– Al-RAPAX G30 geometry for maximum metal removal rate
– Thro’ coolant for emulsion or MQL
– WJ30CA grade (CrN-coated)
– WJ30UU grade (uncoated),

HPC pocket and base finishing

WING RIB

Aluminium

The wing ribs are structural components within the wing. Together with the longerons, they form the framework of the wing. The two principal structural elements of the wing are light, have high load-bearing capacity and are extremely durable. They also ensure the overall rigidity of the wing. In order to ensure this stability to be maintained accessibility, the machines, tool geometries and machining techniques must be designed cursorily not only for maximum process safety, but also the results must be extremely robust. This applies in particular for new generations such as the 2050 aluminium-lithium generations. In order to enable this alloy to be machined perfectly high performance high-speed steel end milling strategies must be selected, using carbide or PCD tools. Whether working with indexable insert tools, carbide tools or PCD tools, whether working with indexable insert tools, carbide tools, or PCD tools, different requirements for quality and process reliability, milling strategies must be designed to perfectly suit the material. Walter high-performance solutions for high concentricity ensure low axial cutting forces and, with high-speed milling technology, produce high temperatures at the tool cutting edge. Accurate machining at very high speeds is a guarantee for high-quality tools and fixturing are therefore crucial for ensuring process reliability. Up to 100 percent longer tool life thanks to the highest possible metal removal rate.

BENEFITS FOR YOU

– Constant helix angle
– Coolant thro’ for MQL
– Vibration-free thanks to the microgeometry
– Microgeometry of the centre cutting edge
– Thro’ coolant for emulsion/MQL
– WJ30CA grade (CrN-coated)
– WJ30UU grade (uncoated),

HPC rough milling of pocket structures

Walter Prototyp MB 266 Supreme

YOUR APPLICATION

– Al 30 geometry for finishing and maximum metal removal rate
– Thro’ coolant for emulsion/MQL
– WJ30UU grade (uncoated)

HPC rough/finishing milling of pocket structures

Walter Protoyp HPC Al30 close pitch cutter

YOUR APPLICATION

– New PVD coating technology
– Microgeometry of the centre cutting edge
– Thro’ coolant for emulsion/MQL
– WJ30CA grade (CrN-coated)
– WJ30UU grade (uncoated),

Finishing pocket base

Walter Protoyp HPC Al31 Supreme

YOUR APPLICATION

– New PVD coating technology
– Very high metal removal rates on single and multiple components

Walter Protoyp HPC Al38 close pitch cutter

YOUR APPLICATION

– New PVD coating technology
– Very high metal removal rates on single and multiple components

Walter Protoyp MB 266 Supreme

YOUR APPLICATION

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The landing gear main cylinder cushions impacts during landing and enables the landing gear to be extended and retracted. The number and size of this central element may vary depending on the size of the aircraft. However, all landing gear main cylinders must always meet the highest safety standards. For this reason, only a small number of materials are suitable for producing these components, mainly titanium alloys and high-alloy steels such as 300M. However, the material is not the only demanding aspect of these components, as their complexity is also constantly increasing. An ever-expanding number of add-on parts are being integrated into the forged blank for new models. For this reason, an optimal machining strategy is required alongside the tool technology. The most important types of machining operations include contour milling, turning and drilling.

**YOUR APPLICATION**
Roughing and semi-finishing of transitional radii.

**OUR SOLUTION**
F2339 ball nose mill

- Available with and without peripheral cutting edges
- Integrated fail-safe device for easy and secure tool handling
- Soft-cutting, circumference-sintered indexable inserts
- Modern Tiger-tec® Silver cutting tool material grades for optimum tool life and excellent cutting data

**BENEFITS FOR YOU**
High stability, process reliability and long tool life. Maximum cost-effectiveness thanks to soft-cutting indexable inserts with low power consumption.

**YOUR APPLICATION**
5-axis contour milling

**OUR SOLUTION**
F2334R round insert cutter

- Round inserts with location flats ensure high-stability insert clamping
- Designed for maximum feed rates and cutting efficiency
- Powered by Tiger-tec® Silver

**BENEFITS FOR YOU**
High process reliability and cost reduction. Ideal for roughing steels and difficult-to-cut materials such as titanium alloys.

**YOUR APPLICATION**
Drilling connection holes

**OUR SOLUTION**
Walter Xtra-tec® B4013 point drill

- Drill with exchangeable carbide insert
- Internal coolant supply ensures cooling directly on the drill insert
- High positive geometry

**BENEFITS FOR YOU**
High productivity thanks to rapid drilling cycles and process reliability due to zero vibration as a result of insert positive locking.

**YOUR APPLICATION**
Profiling of the mating face

**OUR SOLUTION**
Walter Xtra-tec® F4030 high-performance milling cutter

- Surface milling, plunge milling and copy milling cutter with double sided Trigon indexable insert
- Long tools and stable indexable insert with Tiger-tec® Silver cutting tool material
- Six usable cutting edges per indexable insert
- Feed per tooth rates of up to f, 3.5 mm are possible

**BENEFITS FOR YOU**
High productivity, process reliability and long tool life thanks to high machining volume with low cutting depths and high feed per tooth rates. Lower process costs and reduced vibrations.

**LANDING GEAR – MAIN CYLINDER**

**High-alloy steels (300M, 4340)**
YOUR APPLICATION
Roughing, high-feed milling and plunge milling of mating faces

OUR SOLUTION
Walter M4002 high-feed milling cutter

- Four cutting edges per indexable insert
- System insert suitable for universal use
- Highly positive geometries with low power requirements
- Powered by Tiger-tec® Silver with CVD-coated WSM45X grade

BENEFITS FOR YOU
High productivity and tool life, high cost savings thanks to four usable cutting edges and reduced procurement and inventory costs. Soft and stable cutting action.

YOUR APPLICATION
Drilling connection bores

OUR SOLUTION
Walter Xtra-tec® B4213 insert drill

- Low hole tolerance due to the optimum balance of forces
- Maximum cost efficiency thanks to indexable inserts with four real cutting edges
- Excellent component surface quality thanks to the wiper edge insert
- Maximum process reliability due to positive locking

BENEFITS FOR YOU
Two indexable inserts with four cutting edges each enable maximum productivity and low tolerances.

YOUR APPLICATION
Roughing titanium structures

OUR SOLUTION
Walter BLAXX M3255 porcupine milling cutter

- Process-reliable, stable design
- Precise coolant supply at every cutting edge
- Maximum number of teeth for maximum metal removal rate
- Four or two cutting edges per indexable insert
- Soft-cutting geometry
- Powered by Tiger-tec® Silver with CVD-coated WSM45X grade

BENEFITS FOR YOU
Soft cutting action, high productivity and process reliability. Extremely cost-effective thanks to long tool life, high metal removal rate and short machining times.

YOUR APPLICATION
Roughing of pocket bases and radius transitions

OUR SOLUTION
F2139 profile milling cutter

- Extremely accurate indexable inserts that are ground on all surfaces
- Special grade for ISO S machining
- Symmetrical body for HSC machining
- Available with optional solid carbide shank for vibration damping when working with long projection lengths

BENEFITS FOR YOU
No line formation or cut spacing. Can be optimised to suit the specific machining situation. Maximum tool life and ideal surface quality on the workpiece.

One of the major components of any aircraft is the landing gear. It absorbs the enormous forces on take-off and especially during landing. Besides the engine, the components used here are subject to the strictest demands in terms of reliability and functionality under extreme conditions. The strut provides the landing gear with support against the longitudinal movement of the wheel. It is positioned in the middle of the landing gear and enables it to be retracted into the aircraft fuselage. There are particular challenges when machining this component as a result of the material. Struts are predominantly manufactured from titanium materials that are difficult to machine such as Ti5553 or Ti6-2-3. Walter milling cutters enable you to accomplish this task reliably and cost-effectively while still ensuring ideal quality.
The landing flaps situated at the rear edge of the wings provide the necessary lift when landing the aircraft. A variety of materials are used when manufacturing them: The flap track usually consists of 15-5 PH stainless steel, Carpenter C465 or TiAl6V4, but may also consist of titanium/aluminium or CFRP/titanium combinations on newer aircraft. The machining of this component—which mainly involves pocket and contour milling—is generally carried out on CNC machining centres or multi-spindle portal milling machines. Walter tools offer optimal tool life and dimensional accuracy for these operations.
WALTER XPRESS AEROSPACE

Get off to a flying start

Challenging machining operations require customised processes. For this reason, Walter Xpress is now available in a version specially tailored to the aerospace industry. Walter Xpress Aerospace enables you to define your own personalised solid carbide milling cutter in an instant. A Walter Aerospace specialist is available at your request to provide you with on-site assistance at your production facility. Your order is sent directly to the Walter production plant. Blanks that have been specially designed for the requirements of the aerospace industry provide the basis of your special tool. This enables us to ensure that your Walter Xpress Aerospace tool is available in the shortest possible time.

MAXIMUM DELIVERY TIME THREE WEEKS:
Walter Xpress Aerospace aims for supersonic speed

ENJOY THE BENEFITS OF WALTER XPRESS AEROSPACE

The name itself says it all. Walter Xpress Aerospace stands out thanks to extremely short delivery times. For you, this means: Three weeks after order receipt at the latest – usually even sooner – you will receive custom-designed tools from the Walter Xpress Aerospace range of tools. This currently primarily includes Walter Prototyp solid carbide milling cutters. That allows you to keep your own tool stockholding at a low level, and reduce your capital commitment. An additional benefit for you is an extremely high degree of certainty when planning – right from the very start. If you place an enquiry concerning a Walter Xpress Aerospace tool today, you will have all the essential data on your desk by tomorrow.

Use our special forms to define your special tools. These forms are available from our Field Service team or online at: walter-tools.com