

AEROSPACE



INDUSTRY SOLUTIONS



Tungaloy's Aerospace Solutions Take Off

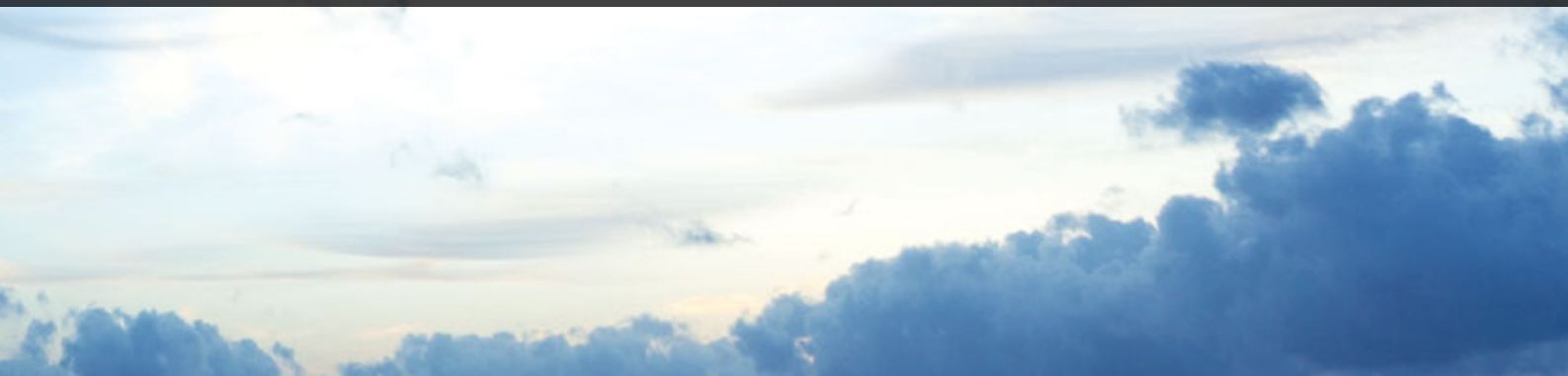
Technological innovation accelerates as competition intensifies. Aircraft designers are pushing the frontiers of material properties to more extreme levels for stronger, lighter, and corrosion- and heat-resistant materials. To meet the high demands from OEMs and remain competitive, manufacturers will need to improve their operational and manufacturing performance.

In this brochure Tungaloy presents an array of the latest tooling solutions for turning, milling, drilling, and grooving, which are particularly vital to aerospace manufacturers in their pursuit of quality, performance, and innovation.





Airframe
Landing Gear
Engine Parts



MillLine
DO TRIPLE MILL
TUNGALOY

Face Milling, Semi-Finishing

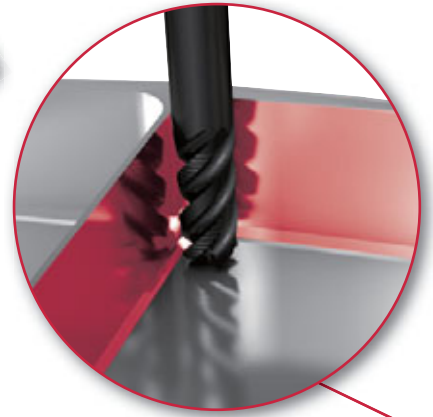
Flexible and economical face milling cutter ideal for efficient removal of large stock. Innovative insert retention and free cutting geometry make heavy-duty milling easy and reliable.



MillLine
SOLIDMEISTER
TUNGALOY

Shoulder Milling, Semi-Finishing

The 2-in-1 solid endmill, able to perform roughing and finishing at the same time. Variable pitch to reduce vibration for increased stability and productivity.



Airframe

Titanium alloy has the highest specific strength (strength/weight ratio) of all metallic materials under 400 Degrees Celsius, it is also light, strong and corrosion resistant. High efficiency machining of Titanium alloy is a challenge because its low thermal conductivity causes machining heat to concentrate on the edge of the cutting tool reducing tool life. Tungaloy's unique chip control geometries and state of the art coating technologies reduce load parameters and increase tool life when machining Titanium grade alloys.



AIRFRAME PARTS MACHINING

MillLine
TUNG-ALUMILL
TUNGALOY

Shoulder Milling

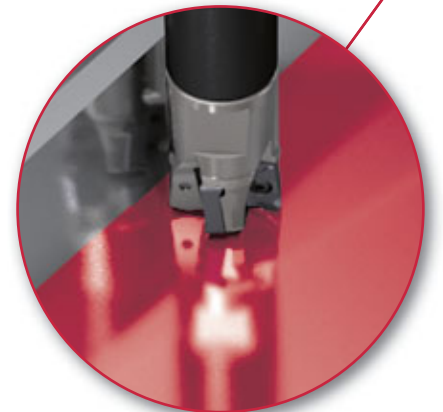
Shoulder milling cutter for machining aluminum alloy parts, with high efficiency. The insert is clamped in a V shaped pocket thus providing the high stability required for high speed machining.



MillLine
DOFEED
TUNGALOY

Pocket Milling, Roughing

Versatile high feed milling cutter with outstanding metal removal efficiency. Top-notch performance also in shouldering, ramping, plunging, helical interpolation, and more.



OSPACE

■ MillLine

TUNGMEISTER
TUNGALOY

Shoulder Milling

Changeable solid carbide milling heads provides quick change with no setup time. The head connection system features face and taper contact which ensures precise indexability, and high stability during operation.



■ MillLine

TUNGF^{ORCE}REC
TUNGALOY

Shoulder Milling

Reliable shoulder milling cutter for the modular tool system. Sophisticated insert and tool body designs assure free cutting and machining reliability, while providing high accuracy and surface finish quality.

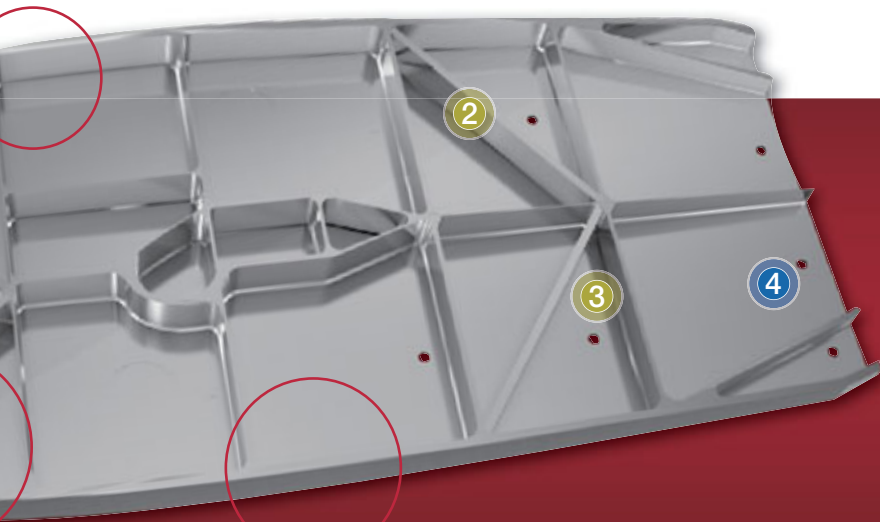


■ DrillLine

DRILLMEISTER
TUNGALOY

Drilling

Changeable head with optimized designed for high speed drilling, with high reliability. The winning combination of perfect edge geometry and AH725 grade in drilling connection holes in titanium alloys.



■ MillLine

TUNG-TRI
TUNGALOY

Shoulder Milling, Roughing

Extended-flute cutter for efficient shoulder milling application. TungTri insert features a unique design which reduces chatter. Very effective especially in long reach machining.



Member IMC Group
Tungaloy

■ MillLine
MILLQ^{UAP}FEED
TUNGALOY

Face Milling, Roughing

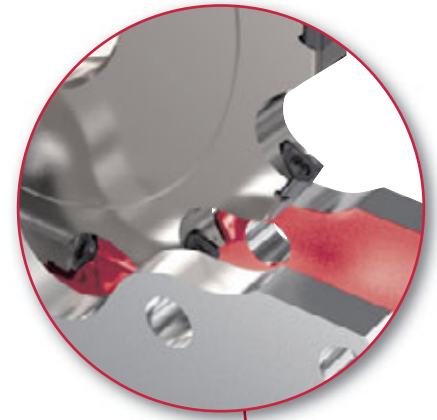
Cutter performs face milling operation at high metal removal rate. Optimized insert design for max. 2.5 mm DOC at 2.0 mm feed per tooth. Long tool life thanks to AH3135 grade.



■ MillLine
TUNGU^{UNIVERSAL}SLOT
TUNGALOY

Slot Milling

Indexable slot milling cutter. Featuring inserts with 6 fully usable cutting edges and built-in wipers for excellent surface quality at low cost per edge.



Airframe

AIRFRAME PARTS MACHINING

■ MillLine
DOFEED
TUNGALOY

Face Milling, Roughing

Versatile high feed milling cutter with outstanding metal removal efficiency. Top-notch performance also in shouldering, ramping, plunging, helical interpolation, and more.



■ MillLine
SOLIDMEISTER
TUNGALOY

Shoulder Milling, Finishing

Solid carbide endmill with unique ground geometry for excellent surface finish and long tool life during machining at high metal removal rates.

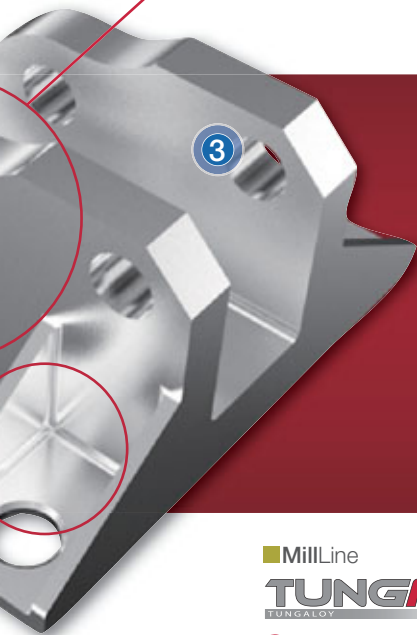
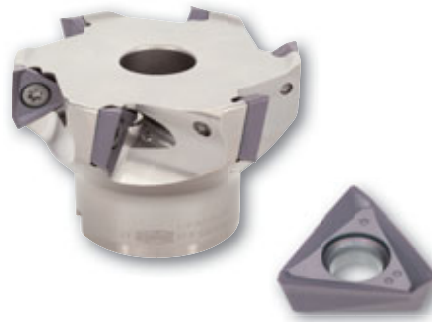


OSPACE

■ MillLine
TUNG-TRI
TUNGALOY

Shoulder & Face Milling

Shoulder milling cutter perfect for efficient and chatter-free removal of large stock in a long reach applications.



■ MillLine
TUNGMEISTER
TUNGALOY

Shoulder Milling

Modular head endmill system. Reduced tool replacement time and regrinding cost for maximum productivity and profit.



■ DrillLine
DRILL F MEISTER
TUNGALOY

Drilling

Changeable-tip drill system optimal for large-diameter hole making. Two effective cutting edges in AH725 grade ensures high speed drillings of connection holes on super alloy components.



■ MillLine
MILLQ^{UP}FEED
TUNGALOY

Face Milling, Roughing

Cutter performs face milling operation at high metal removal rate. Optimized insert design for max. 2.5 mm DOC at 2.0 mm feed per tooth. Long tool life thanks to AH3135 grade.



■ MillLine
DOFEED
TUNGALOY

Face Milling, Roughing

Versatile high feed milling cutter with outstanding metal removal efficiency. Also ideal for shouldering, ramping, plunging, helical interpolation, and more.



■ MillLine
DOT^{WIST}BALL
TUNGALOY

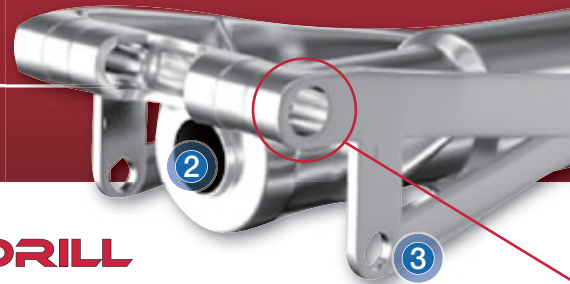
Profile Milling

Sophisticated 4 fully effective helix geometry ensures cost-efficient, 3D profiling or high feed milling. Available in radius or high-feed geometry.



Landing gear

New materials are being developed continuously for landing gear and its parts. Titanium alloys are a popular choice for commercial aircrafts due to its strength to weight ratio. And, special precipitation hardened stainless steels are a best choice due to the toughness, strength and stability, without having to use a corrosion preventive coating like cadmium. Machining both Ti and PH steels requires an appropriate cutting edge geometry to reduce cutting forces, thereby decreasing generated heat and avoiding build up on the cutting edge.



LANDING PARTS MACHINING

■ DrillLine
TAILOREDTOOL
TUNGALOY

Counter-Boring

Indexable deep-hole, counter-boring tool. Delivers high quality holes even on low power machines.



■ DrillLine
TUNGSIX-DRILL
TUNGALOY

Drilling

World's 1st indexable drill system that features double-sided triangular inserts with 6 fully effective edges. High productive and cost-efficient hole making tool.

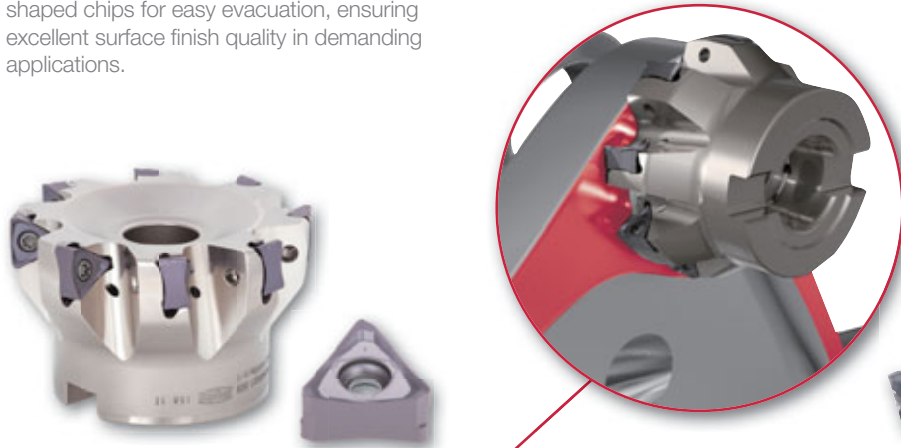


O S P A C E



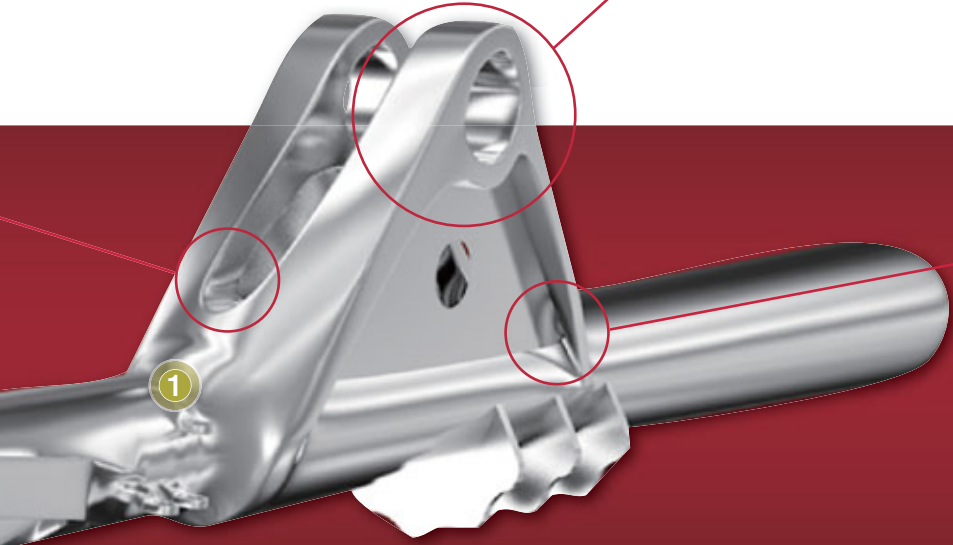
Face Milling

Sophisticated, 6-edged, double-sided triangular inserts create low cutting forces and barrel-shaped chips for easy evacuation, ensuring excellent surface finish quality in demanding applications.



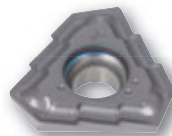
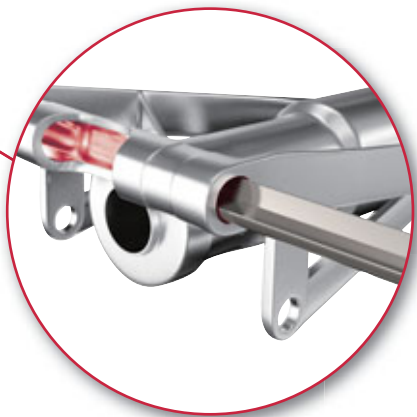
Profile Milling

Modular head endmill system. Reduced tool replacement time and regrinding cost for maximum productivity and profit.



Deep Hole Drilling

Indexable gun drill series, delivering excellent straightness, circularity, and surface quality, while allowing smooth chip evacuation.



TurnLine

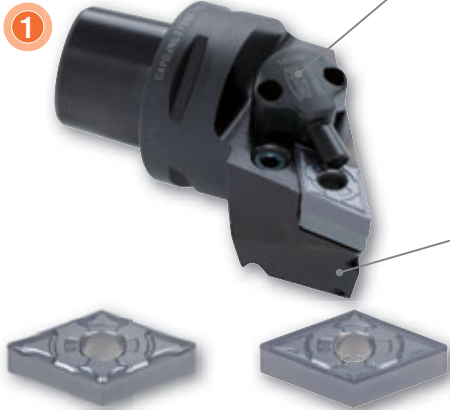
AH8000 SERIES
TUNGALOY

Turning Roughing & Finishing

PVD grade dedicated to ISO S materials. Long tool life and excellent chip control thanks to nano-multi-layered AlTiN coating with high Al-content with dedicated chipbreakers.

TUNG TJET
TUNGALOY

High pressure coolant toolholder system for smooth chip evacuation. Extended tool life at higher cutting parameter range.



HRF chipbreaker

HRM chipbreaker

TUNECAP
TUNGALOY

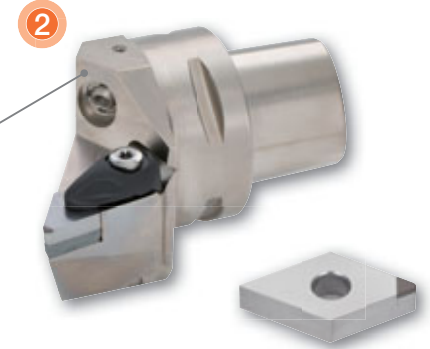
PSC system with polygonal design provides quick tool change, high accuracy, and high repeatability.

TurnLine

T-CBN M714B
TUNGALOY

Turning Finishing

T-CBN grade dedicated to turning heat-resistant superalloys. High thermal and wear resistance. Excellent finishing result and long tool life at high cutting parameters.



Shaft - Engine

Many special steel alloys like 300M and HP9-4-30 and high tensile bearing steels such as m50 NiL are used in the aerospace industry. These materials, once heat treated are challenging to machine due to the hardness of the material which can reduce tool life. Tungaloy's complete line up of CBN turning grade inserts offer the solution in extending tool life with consistent performance. With the advent of the new M714B grade, Tungaloy has added another solution to the difficulty of machining these aerospace products.

AIRCRAFT ENGINE MACHINING



DrillLine

TAILOREDTOOL
TUNGALOY

Deep Hole Drilling

Tailor-made deep hole drill system dedicated to successful hole-making of heat-resistant superalloys.



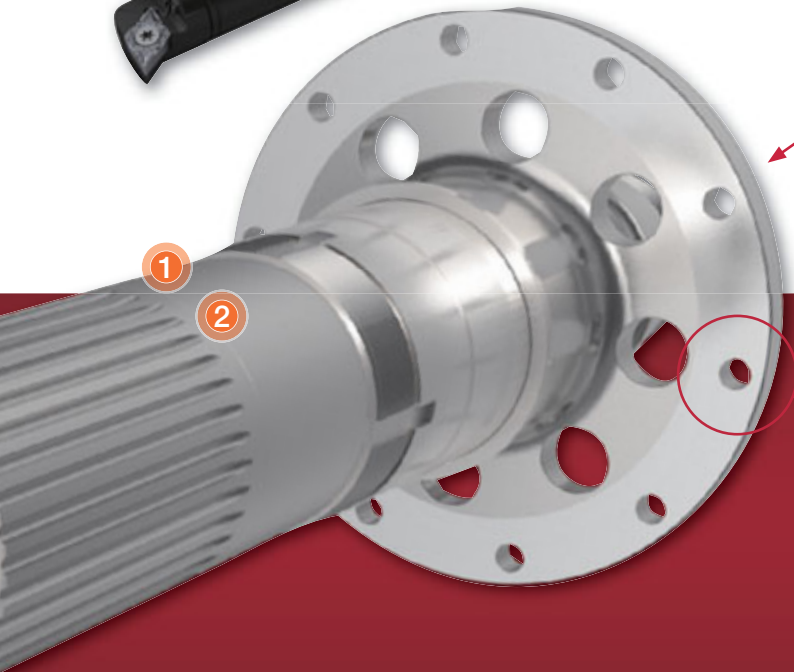
O S P A C E

TurnLine

TAILOREDTOOL
TUNGALOY

Turning Anti-vibration system

Deep turning solutions for machining high depth to diameter internal applications include special anti-vibration boring bar systems with a 'live' vibration dampening system located inside the tool body.



TurnLine

TUNGTHREAD
TUNGALOY

Threading

Indexable threading tool system with a rich lineup of inserts and holders for a wide standard range of threads.



DrillLine

DRILLMEISTER
TUNGALOY

Drilling

Head changeable drill series with optimized drill heads and bodies for high speed and reliability.



Member IMC Group
Tungaloy

TurnLine

AH8000 SERIES

Turning Roughing & Finishing

PVD grade dedicated to ISO S materials. Long tool life and excellent chip control thanks to nano-multi-layered AlTiN coating with high Al-content with dedicated chipbreakers.

TUNG TJET

High pressure coolant toolholder system for smooth chip evacuation. Extended tool life at higher cutting parameter range.

TUNGCAP

PSC system with polygonal design provides quick tool change, high accuracy, and high repeatability.



HRF chipbreaker

HRM chipbreaker

TurnLine

T-CBN M714B

Turning Finishing

T-CBN grade dedicated to turning heat-resistant superalloys. High thermal and wear resistance. Excellent finishing result and long tool life at high cutting parameters.



Disk - Engine

Nickel based INCONEL® and WASPALOY® are common examples of super alloys used in jet engine components because they maintain their strength even under high temperatures. However, these properties also cause low machinability due to extreme wear of the cutting tools used in the machining process. Tungaloy's advanced coating technologies offer consistent and extended tool life under these extreme conditions. The New AH8000 grades for turning of INCONEL® and WASPALOY® offer an effective solution in the machining process.

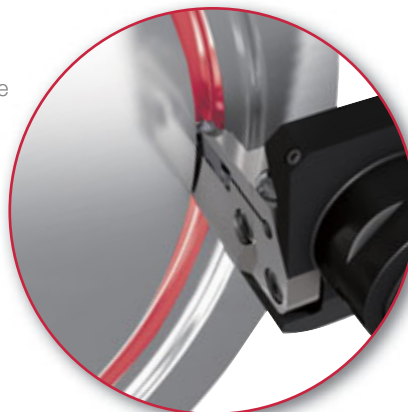
AIRCRAFT ENGINE MACHINING

TurnLine

TUNGCUT

Face Grooving

Modular type tool, a flexible solution using only one tool for various applications. Coolant is channeled through the adaptor direct to the cutting edge for longer insert tool life and improved performance.

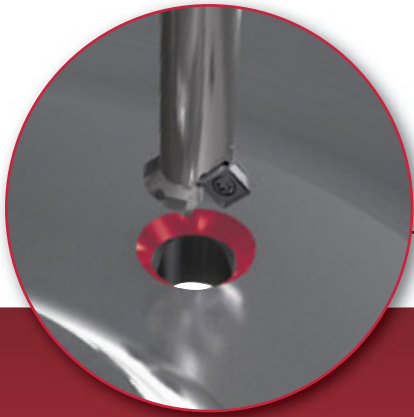
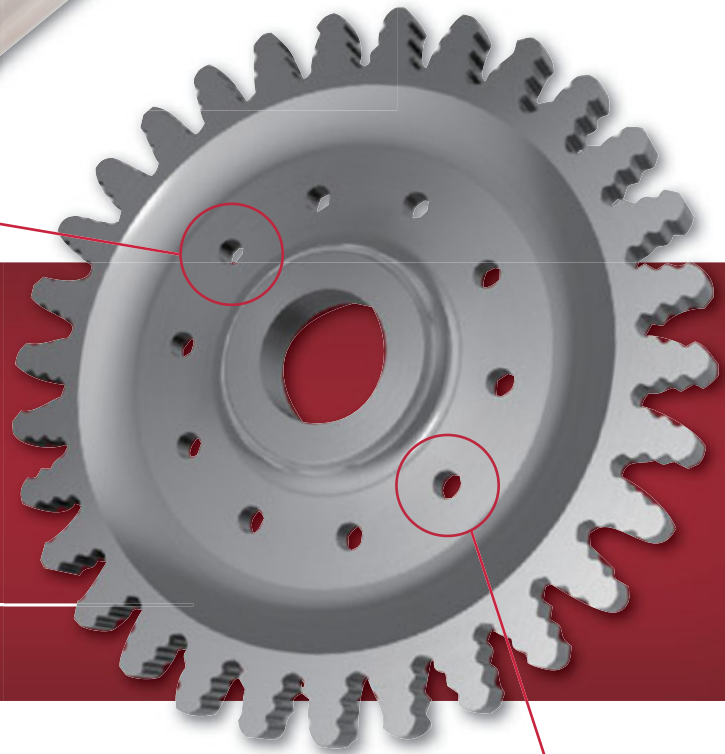


■ MillLine

TUNGQUAD
TUNGALOY

Chamfering

Multi-functional chamfer tool with compact, free-cutting 4-edged inserts. Use the same tool for applications. Reduced tool inventory and cycle time for maximum productivity.

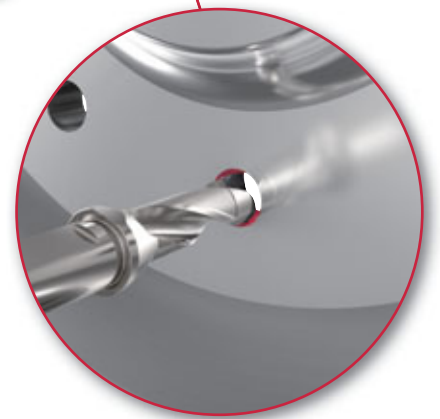


■ DrillLine

DRILLMEISTER
TUNGALOY

Drilling

Head changeable drill series with optimized drill heads and bodies for high speed and reliability.

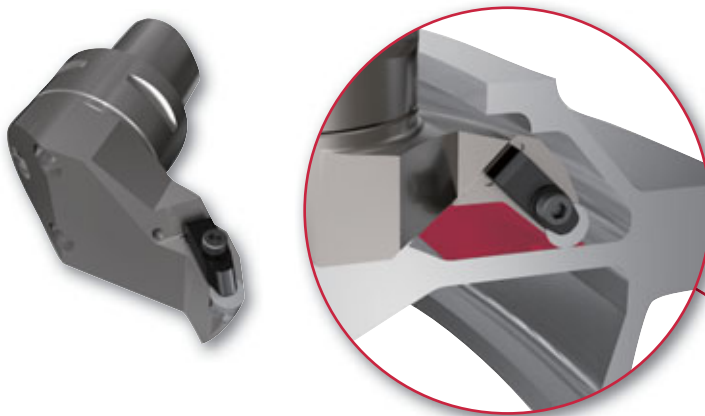


Member IMC Group
Tungaloy

TurnLine
TAILOREDTOOL
TUNGALOY

Turning, Roughing

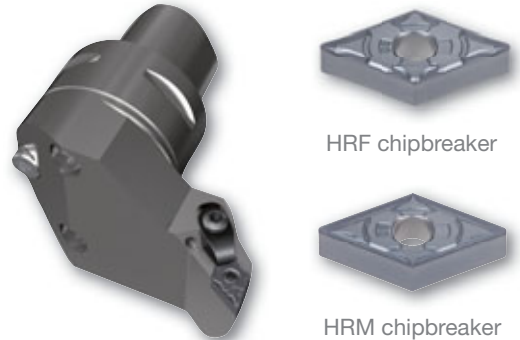
Ceramic insert for high-speed roughing of disc profiles. An excellent combination of high wear resistance and toughness for nickel-based alloys like Inconel.



TurnLine
AH8000 SERIES
TUNGALOY

Turning, Finishing

PVD grade dedicated to ISO S materials. Long tool life and excellent chip control thanks to nano-multi-layered AlTiN coating with high Al-content with dedicated chipbreakers.



Disk & Blisk - Engine

AIRCRAFT ENGINE MACHINING

TurnLine
TUNGECUT
TUNGALOY

Face Grooving

High-performing and flexible face grooving system. Excellent wear and thermal resistance.



OSPACE

TurnLine

AH8000 SERIES

Turning Roughing & Finishing

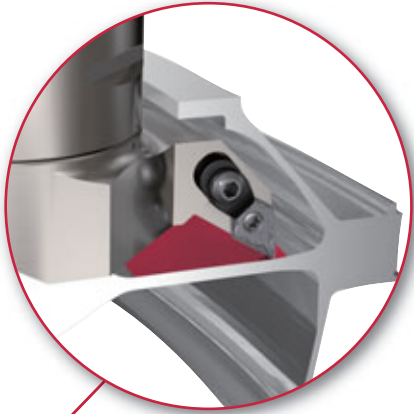
PVD grade dedicated to ISO S materials. Long tool life and excellent chip control thanks to nano-multi-layered AlTiN coating with high Al-content with dedicated chipbreakers.

TUNG TJET

High pressure coolant toolholder system for smooth chip evacuation. Extended tool life at higher cutting parameter range.

TUNGCAP

PSC system with polygonal design provides quick tool change, high accuracy, and high repeatability.



HRF chipbreaker

HRM chipbreaker



TurnLine

TUNGCUT

Face Grooving

Modular type tool, a flexible solution using only one tool for various applications. Coolant is channeled through the adaptor direct to the cutting edge for longer insert tool life and improved performance.



MillLine

BALLFINISH
TUNGALOY

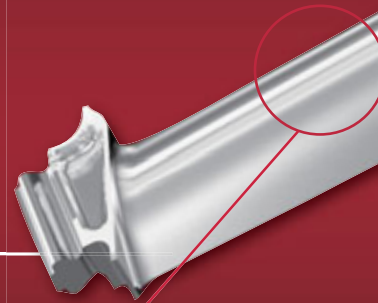
Profile Milling, Finishing

Multi-purpose, indexable endmill system. Excellent surface finish and stable machining thanks to secure insert clamping and minimum run-out.



Impeller & Blade - Engine

AIRCRAFT ENGINE MACHINING

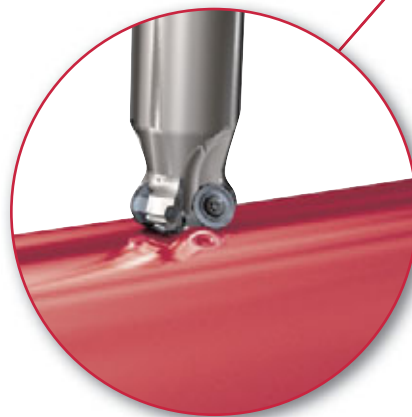


MillLine

ROUND SPLIT
TUNGALOY

Profile Milling, Roughing

3D profiling cutter with round or serrated inserts. Excellent vibration-dampening with high metal removal rate in long reach applications.



O S P A C E

MillLine

DOFEED
TUNGALOY

Profile Milling, Roughing

Versatile high feed milling cutter with outstanding metal removal efficiency. Also ideal for shouldering, ramping, plunging, helical interpolation, and more.

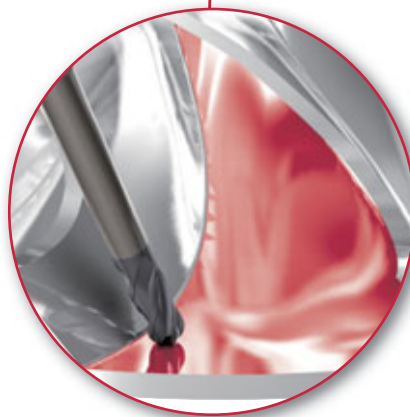


MillLine

SOLIDMEISTER
TUNGALOY

Profile Milling, Finishing

Ball nose endmill with optimized design for excellent stability and surface finish quality.



Member IMC Group
Tungaloy

TurnLine

AH8000 SERIES
TUNGALOY

Turning Roughing & Finishing

PVD grade dedicated to ISO S materials. Long tool life and excellent chip control thanks to nano-multi-layered AlTiN coating with high Al-content with dedicated chipbreakers.

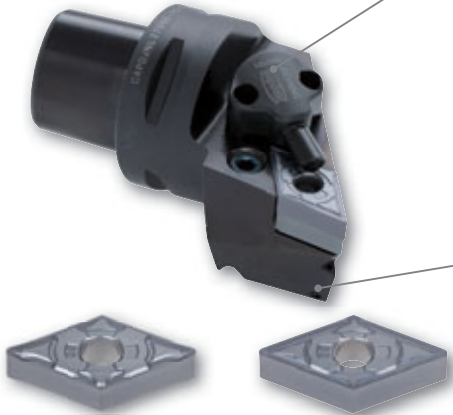
TUNG TJET
TUNGALOY

High pressure coolant toolholder system for smooth chip evacuation. Extended tool life at higher cutting parameter range.



TUNGCAP
TUNGALOY

PSC system with polygonal design provides quick tool change, high accuracy, and high repeatability.



HRF chipbreaker

HRM chipbreaker



Case - Engine

AIRCRAFT ENGINE MACHINING

MillLine

TUNGREC
TUNGALOY

Shoulder Milling, Semi-Finishing

Milling cutter for accurate 90° shoulders. Optimal insert geometry for close tolerance, step-free walls.



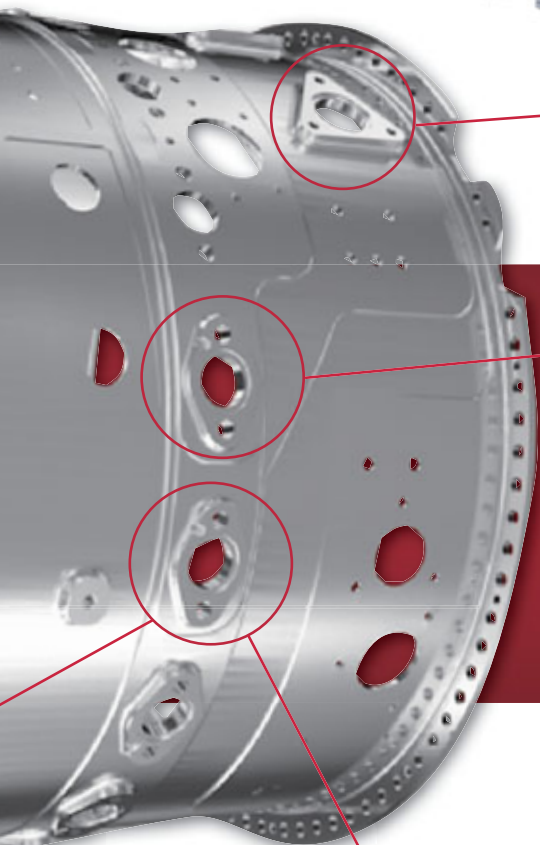
OSPACE

■ MillLine

THREADMILLING

Thread Milling

Vast range of thread milling tools available in solid, indexable inserts, or modular system. Significant machining flexibility and maximum productivity.



■ DrillLine

DRILLMEISTER

Drilling

Head changeable drill series with optimized drill heads and bodies for high speed and reliability.



■ MillLine

SOLIDMEISTER

Shoulder Milling, Finishing

Highly efficient 4-edged endmill with radius corners. Stable milling and superior wall and surface finish thanks to the optimal flute-core design.



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