Notes to Users of this Catalogue

- This catalogue is an introduction to Tungaloy Cutting Tools.
- Specifications and stock status described in this catalogue are subject to change without prior notice.
- All unit sizes are metric - in millimeter (mm).
- Units used in the catalogue conform to ISO standards in principle.

Stock status symbols

●	: Stocked items
▲	: Discontinued items
★	: Available in 2013

No symbol: Not stocked

Note: The products described in this catalogue are as of Jul. 2012.

Ordering information

- When ordering, specify the Cat. No., grade and quantity.
  (Example for TAC inserts)
  CNMG120408-TM T9125, 10 pcs.
- TAC toolholders and TAC mills are shipped without inserts. Inserts must be ordered separately.
- For the special grades or special products, please contact your nearest Tungaloy sales office.

Constitution of Tungaloy Cutting Tool Catalogue

In this catalogue, products are described by machining types such as TAC turning inserts, TAC turning toolholders, threading tools and drilling tools. Users can select optimum tools by using the following searching methods.

●Searching from the numerical / alphabetical index (Chapter 16)

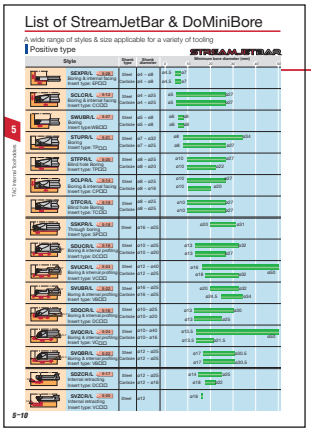
Catalogue numbers of products and parts are listed in numerical and alphabetical order in Chapter 16. When searching the product of known Cat. No., use this index.

●Searching from the classification of tools

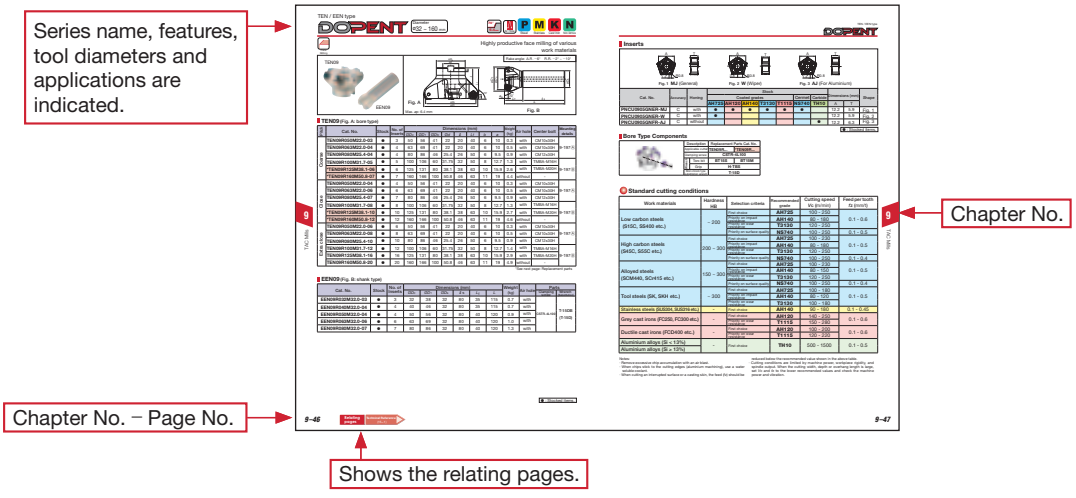
When searching the product from the tool type, open the title page of the chapter of the tool type.
For example, when searching the TAC boring tool:

●Searching from the tool list in each chapter

Search from the tool list.



●Basic Constitution of Tungaloy Cutting Tool Catalogue



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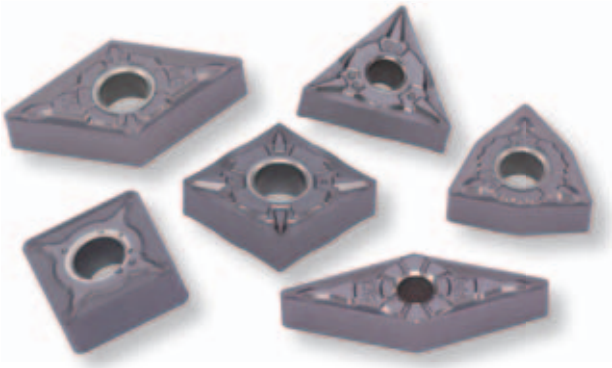
Tungaloy Cutting Tools

Special surface technology

PREMIUMTEC
TUNGALOY



New Grades

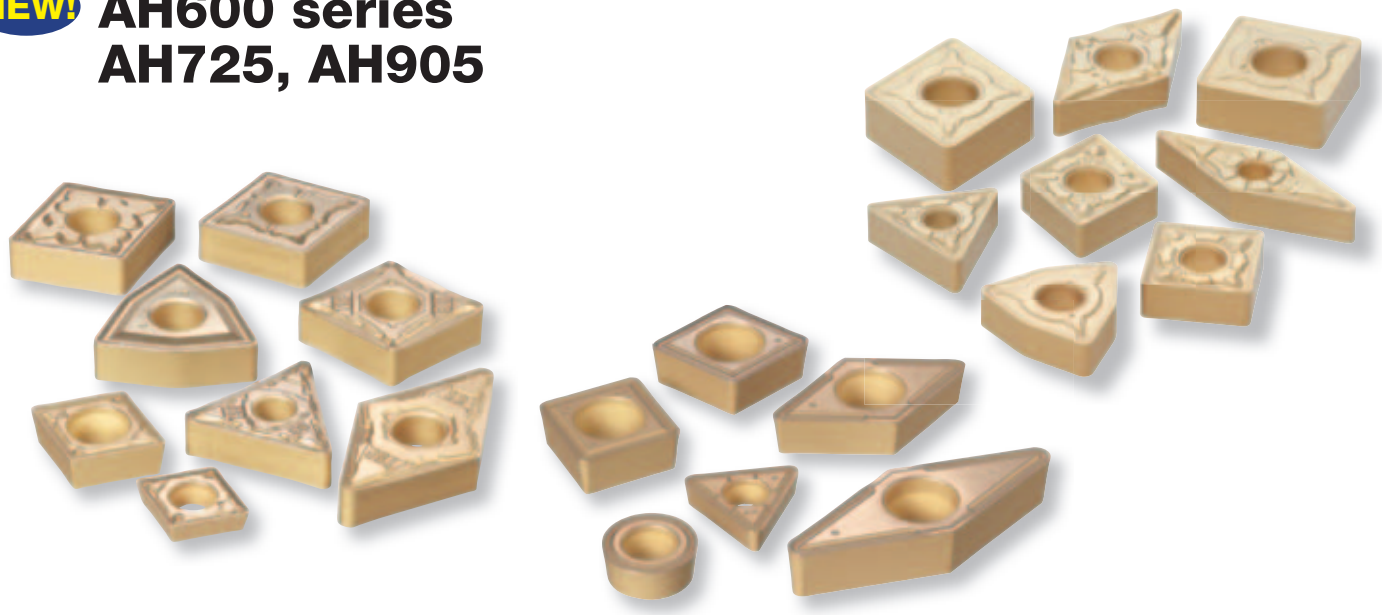
T9100 series

NEW! **T6100 series**

T5100 series

NEW! **AH600 series**

AH725, AH905

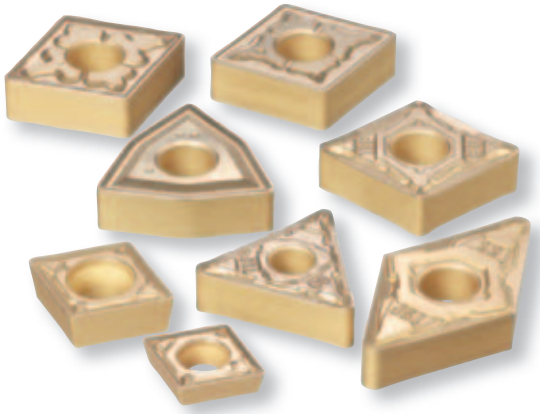


T9100 SERIES
TUNGALOY

NEW! PREMIUMTEC
TUNGALOY

New CVD coated grade for steel turning

Provides a high level of reliability with excellent fracture resistance!



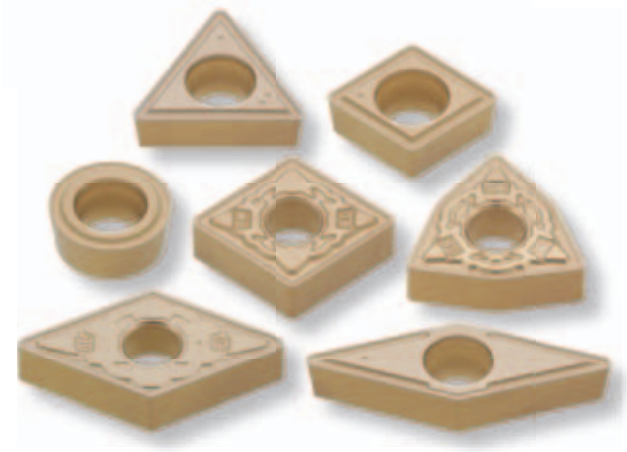
T5100 SERIES

TUNGALOY

PREMIUMTEC

TUNGALOY

Excellent cutting performance with significantly improved wear and impact resistance.



T6100 SERIES

TUNGALOY

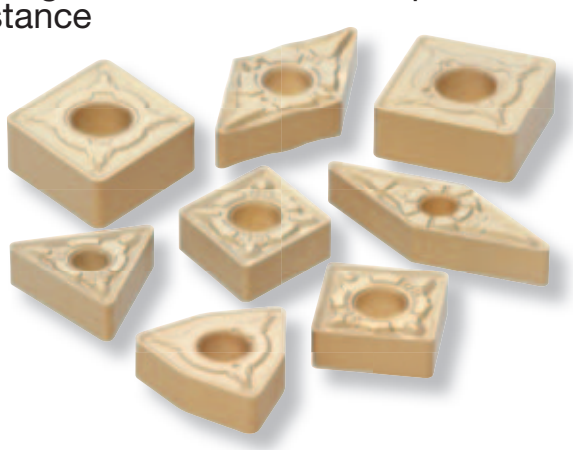
NEW! PREMIUMTEC

TUNGALOY

Incredible reliability in stainless steel turning

T6120: Suitable grade for high speed cutting due to excellent plastic deformation resistance

T6130: Versatile grade for medium to high speed cutting. This is credit to exceptional wear resistance



AH600 SERIES
TUNGALOY

NEW! PREMIUMTEC
TUNGALOY

Exceptional tool life due to the newly developed PVD coating

AH630: Versatile grade that has an excellent balance of fracture and wear resistance

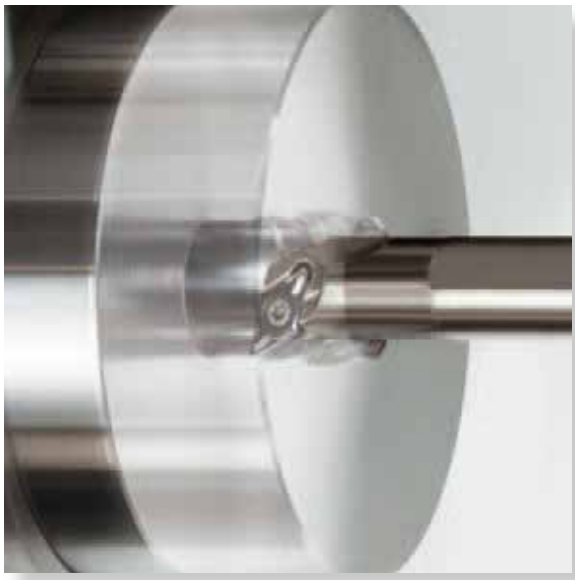
AH645: Provides outstanding reliability with high fracture resistance

DOMTURN
BORE LINE

NEW!

Sharpness of positive inserts with twice the number of cutting edges

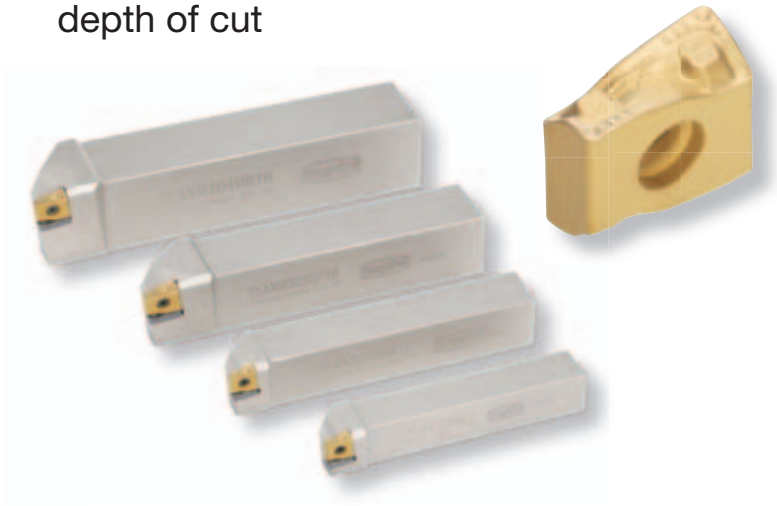
- Applicable from ø12 mm min bore with double sided insert
- High performance toolholders that have high rigidity and excellent chip evacuation

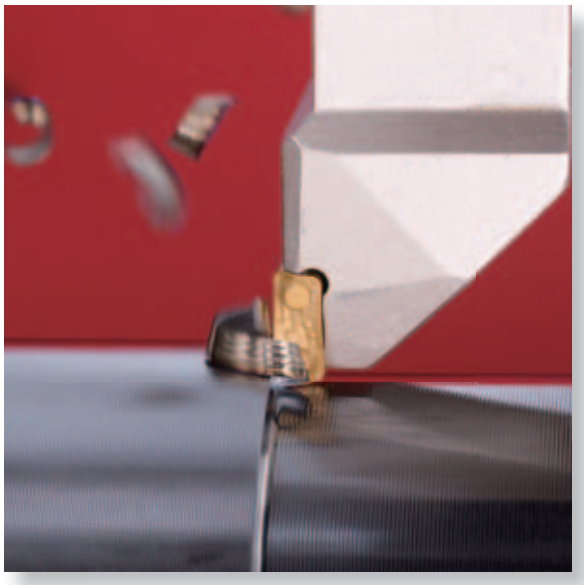


TURNTEC
TUNGALOY

Cutting-edge technology provides maximum productivity

- Suitable for highly productive roughing operations
- Long cutting edges cover a fluctuating depth of cut





TURNINGA
TUNGALOY

Toolholders for external and internal turning

Improved clamping forces provide high accuracy and stable long tool life

STREAMJETBAR
TUNGALOY

Toolholders for internal turning

Highly rigid boring bars with excellent chip evacuation

TUNGCUT
TUNGALOY

The complete grooving solution

- Multifunctional system for diverse grooving needs
- NS530 Cermet grade has been extended to feature fine surface finishing inserts

TINYTURN
TUNGALOY

NEW!

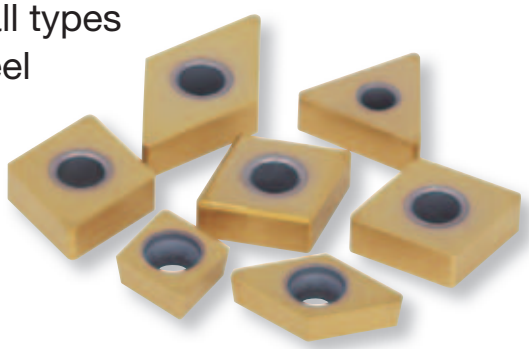
Solid boring bars applicable for min ø0.6 mm bore!

- Fine cutting edge and smooth coating offer high precision machining
- Wide range of items can be applied to a wide range of internal operations

BXM SERIES
TUNGALOY

The new standard coated CBN grade for hardened steel machining

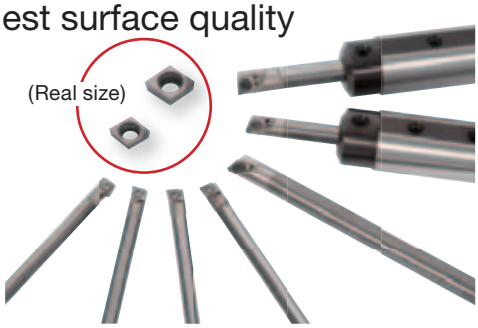
Applicable for all types of hardened steel turning

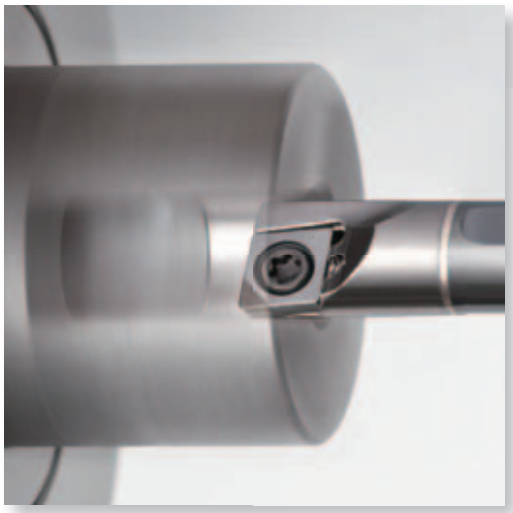


MINI T-CBN
TUNGALOY

NEW! **The smallest indexable CBN inserts in the world**

- For boring down to ø4.5 mm with CBN inserts
- Sharp cutting edge reduces the cutting forces and provides the finest surface quality

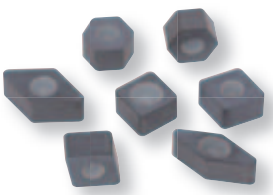




DIMPLEFX
TUNGALOY

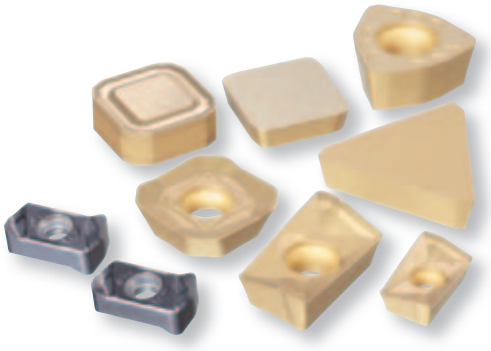
Ceramic insert with dimple for high speed machining of cast irons

New innovative clamping system delivers high productivity!



Special surface technology

PREMIUMTEC
TUNGALOY



New Grades

AH725 / AH130 / T1115

Provides a smooth insert surface to prevent chip adhesion and improve chipping resistance

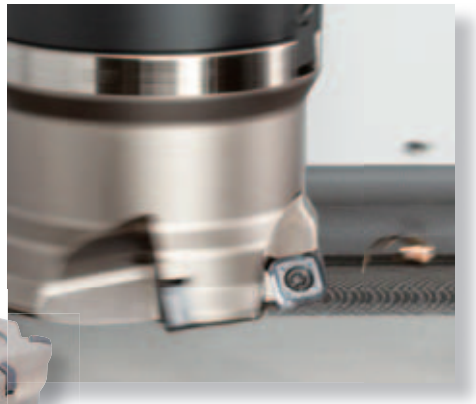
DOFEED SERIES
TUNGALOY

NEW! ***New-generation of high feed cutters offering incredible productivity***

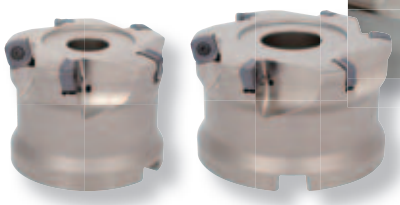
- Large inclination drastically reduces the cutting forces and prevents chattering
- Two sizes of insert allow a wider tool diameter range

DOFEEDQUAD
TUNGALOY

NEW! ***High productivity and economical solution with 8 corner type inserts***



- Dovetail structure improves the clamping strength
- Ideal insert with high fracture resistance for outstanding productivity



ROUGHINGMILL SERIES

TUNGALOY

NEW! ***Long cutting edges create incredible productivity***

TUNGQUAD

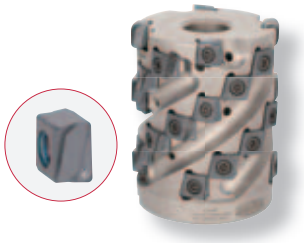
- 4 cornered insert with excellent sharpness
- Suitable for roughing operations on small to medium size machines

TUNGREC

- Insert geometry with large positive rake angle reduces the cutting forces
- Newly developed cutter body with high density insert pocket provides the exceptional productivity

TECMILL

- Tangential insert with tough cutting edges allow the high productivity
- Suitable for heavy machining of a wide range of materials



TUNGQUAD

TUNGALOY

Highly productive small diameter cutter

TUNGREC
TUNGALOY

The multi-purpose high precision cutter

- Helical cutting edges provide smooth cutting
- 4 types of chipbreaker and various kinds of cutter bodies cater to a wide range of applications

TECMILL
TUNGALOY

Highly rigid shoulder milling cutters for roughing operations with tangential insert

- Economical double sided insert with 4 edges
- Excellent balance with toughness and sharpness

TECSLOT
TUNGALOY

NEW!

Incredibly secure system for slot milling

- Excellent productivity credit to a rigid cutter body with high density insert pockets
- Thick tangential insert with tough cutting edges

DOREC
TUNGALOY

NEW!

Economical double sided square insert with high level of sharpness

- Remarkable productivity with tough cutting edges
- Innovatively designed cutting edges reduce the cutting forces

DOOCTO TUNGALOY

DOQUAD TUNGALOY

Face milling cutter

The best solution for steel and cast iron milling!

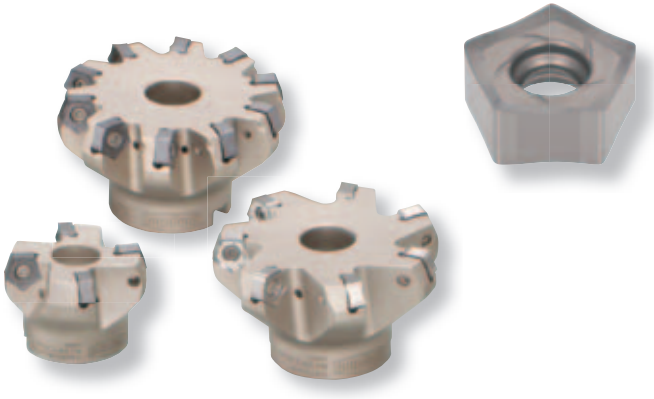
- Available with octagonal or square inserts and different cutter bodies for each type of insert
- 2 types of clamping systems
- Extremely versatile series

DOPENT TUNGALOY

Face milling cutter

Pentagonal double sided insert with 10 cutting edges

- High productivity at high feed rate condition
- NS740 Cermet grade is expanded, providing exceptional surface finish



ROUNDSPLIT
TUNGALOY

Radial milling cutter

Serrated cutting edges prevent chattering

- Serrated edges provides smooth cutting in long overhang applications
- Serrated and round inserts fit in the same pocket

TUNGMEISTER
TUNGALOY

Head changeable endmills

Endmilling innovation!

- The most effective tooling with hundreds of combinations!
- Easy head clamping system drastically reduces tool changing time

TUNGSIX-DRILL

TUNGALOY

NEW!

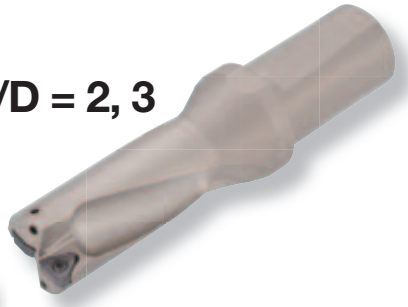
Special surface technology PREMIUMTEC

TUNGALOY

The most economical solution for drilling with innovative insert and grade

- Enhanced corner offers incredibly stable drilling
- New revolutionary grade AH9030 allows long tool life

Diameter range:
ø28 ~ ø54.0 mm L/D = 2, 3



TUNGDRILLTWISTED

TUNGALOY

Higher productivity due to superior chip evacuation!

- Newly developed DG chipbreaker is added
- 4 types of chipbreaker demonstrate the excellent chip control in a wide range of materials

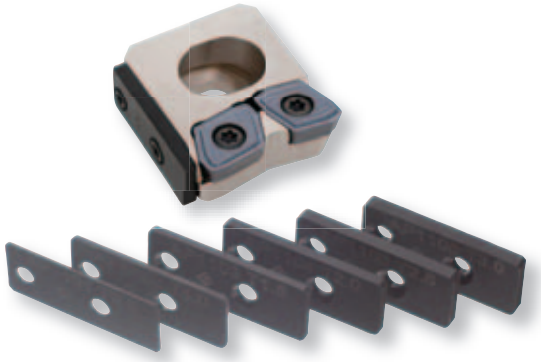
NEW!

TUNGDRILLBIG

TUNGALOY

Expandable diameter drill

- The drill diameter can be changed by using “Setting plates”
- 5 kinds of drill bodies cover the entire diameter range ø55 - ø80 mm



DRILLMEISTER

TUNGALOY

NEW!

The innovative head changeable drill for high productivity

- Easy and secure clamping system drastically reduces tool set-up time
- DrillMeister with exclusive chamfering adapter reduces machining process time

TUNGHOLD
TUNGALOY

Tooling System

Unique function and wide range of variation

A large variety of holders, collet chucks, endmill holders and face mill arbors that can be applied to a wide range of machining applications.

TUNGCAP
TUNGALOY

NEW!

Tooling System

Quick change system for flexible machines

TungCap has a polygon design taper that can be applied to a wider range of cutting applications on flexible machines.

Safety Notes

Tungaloy implements the highest standards when manufacturing cutting tool products. The following precautions must be exercised whenever working with or near metalcutting machinery and metalcutting tool products.

1. Cemented tungsten carbide, coated carbide, cermet, ceramic, polycrystalline compact (hard materials) are hard and brittle. Therefore, caution must be used during cutting operation. During the cutting operation, tools may be broken due to thermal shock, excessive tool wear or mishandling which may cause serious injury to the operator.

2. During operation of the machine, a machine guard, safety glasses, gloves etc. should always be used to prevent injury due to hot flying chips, fragmented cutting tools, broken work pieces, etc.

3. Some cutting tools may have sharp edges. Safety gloves should always be used when handling these products.

4. During the cutting operation, high temperature sparks may be generated by broken tools or chips and could cause a fire. Precautions must be taken during machine placement and while using water-insoluble cutting fluid.

5. When grinding carbide cutting tool materials, adequate ventilation, respiratory protection mask and eye protection should be used to protect the operator from grinding dust injury.

6. Consult the Material Safety Data Sheet (MSDS) for details on potentially hazardous properties and substances associated with grinding carbide. (MSDS sheets are available upon request.)

7. Tungaloy suggests the implementation of well established safety practices during the use of all cutting tool products. Tungaloy recommends compliance with industry safety standards in all sectors of the work environment.

Unified symbols for cutting conditions and tool dimensions

The Japan Cemented Carbide Tool Manufacturers' Association, in cooperation with The Japan Small Cutting Tools Association, has enacted unified quantity symbols of cutting conditions and tool specifications for users' convenience.

(Quantity symbols of cutting conditions) Symbol / Unit

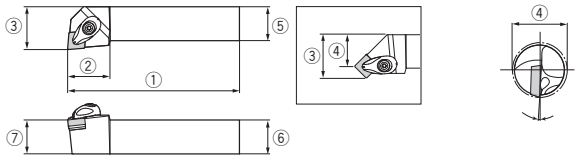
Turning	Cutting speed		Feed		Depth of cut		Cutting edge width		Work diameter	
	Vc	m/min	*f*	mm/rev	*ap*	mm	*W*	mm	*øDm*	mm
	Power consumption		Specific cutting force		Theoretical surface roughness		Corner radius		Number of revolutions	
	Pc	kW	*kc*	MPa	*h*	μm	*rε*	mm	*n*	min^{-1}

Milling	Cutting speed		Feed speed		Feed per tooth		Feed		Number of teeth	
	Vc	m/min	*Vf*	mm/min	*fz*	mm/t	*f*	mm/rev	z	
	Axial depth of cut		Radial depth of cut		Pick feed		Power consumption		Specific cutting force	
	ap	mm	*ae*	mm	*Pf*	mm	*Pc*	kW	*kc*	MPa
	Chip removal rate		Number of revolutions							
	Q	cm^3/min	*n*	min^{-1}						

Drilling	Cutting speed		Feed speed		Feed		Tool diameter		Power consumption	
	Vc	m/min	*Vf*	mm/min	*f*	mm/rev	*øDc*	mm	*Pc*	kW
	Torque		Thrust force		Specific cutting force		Drilling depth		Number of revolutions	
	Mc	N·m	*Tc*	N	*Kc*	MPa	*H*	mm	*n*	min^{-1}

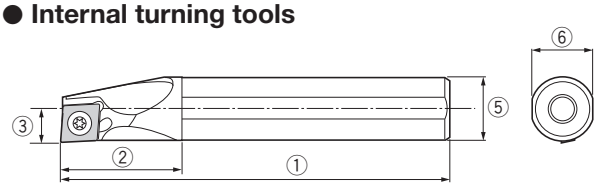
Dimensional symbols of turning tools

● External turning tools



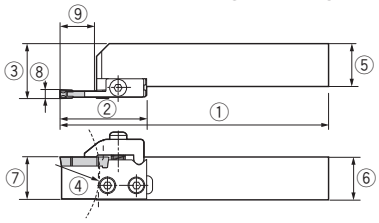
①	②	③	④	⑤	⑥	⑦
Overall length	Head length	Distance to cutting edge	Distance to cutting edge	Shank width	Shank height	Cutting edge height
L1	*L2*	*f*	*f1*	*b*	*h*	*h1*

● Internal turning tools



①	②	③	④	⑤	⑥
Overall length	Head length	Distance to cutting edge	Minimum bore diameter	Shank diameter	Shank height
L1	*L2*	*f*	*øDm*	*øDs*	*h*

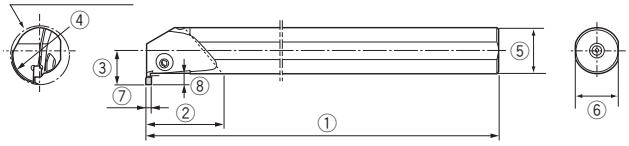
● External and face grooving tools



①	②	③	④	⑤
Overall length	Head length	Distance to cutting edge	Maximum grooving diameter	Shank width
L1	*L2*	*f*	*øDm*	*b*
⑥	⑦	⑧	⑨	
Shank height	Cutting edge height	Cutting edge width	Maximum grooving depth	
h	*h1*	*w*	*ar*	

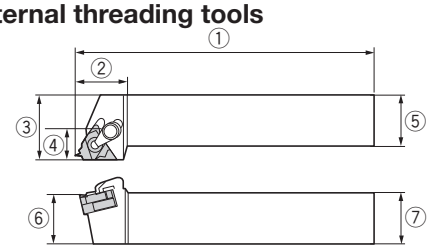
● Internal grooving tools

Min. bore diameter *øDm*



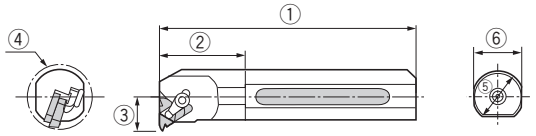
①	②	③	④
Overall length	Head length	Distance to cutting edge	Maximum grooving diameter
L1	*L2*	*f*	*øDm*
⑤	⑥	⑦	⑧
Shank diameter	Shank height	Cutting edge width	Maximum grooving depth
øDs	*h*	*w*	*ar*

● External threading tools



①	②	③	④	⑤	⑥	⑦
Overall length	Head length	Distance to cutting edge	Shoulder width	Shank width	Shank height	Cutting edge height
L1	*L2*	*f*	-	*b*	*h*	*h1*

● Internal threading tools



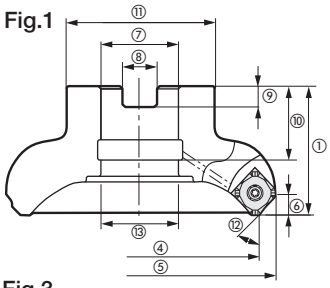
①	②	③	④	⑤	⑥
Overall length	Head length	Distance to cutting edge	Maximum grooving diameter	Shank diameter	Shank height
L1	*L2*	*f*	*øDm*	*øDs*	*h*

Dimensional symbols of milling tools

● Bore type milling tools

Square shoulder cutter

Fig.1



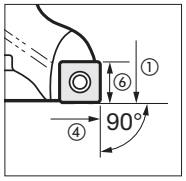


Fig.2

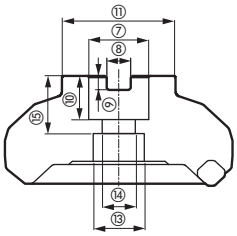


Fig.3

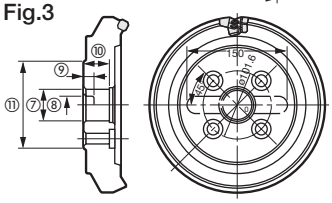
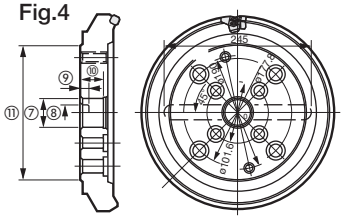
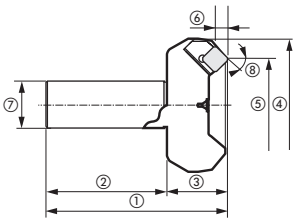


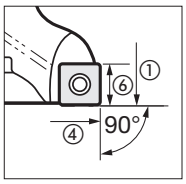
Fig.4



● Shank type milling tools



Square shoulder cutter

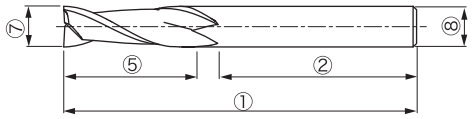


①	②	③	④
Overall length	Shank length	Cutter height	Cutter diameter
L	ℓ_S	L_f	$\varnothing D_c$
⑤	⑥	⑦	⑧
Maximum outer diameter	Maximum depth of cut	Shank diameter	Corner angle
$\varnothing D_1$	ap	$\varnothing D_s$	κ

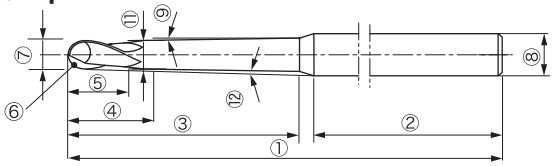
①	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮
Cutter height	Cutter diameter	Maximum outer diameter	Maximum depth of cut	Hole diameter	Key way width	Key way depth	Mounting hole depth	Mounting flat diameter	Corner angle	Mounting bolt counter bore dia.	Mounting bolt hole diameter	Mounting bolt hole depth
L_f	$\varnothing D_c$	$\varnothing D_1$	ap	d	a	b	ℓ	$\varnothing D_b$	κ	$\varnothing d_1$	$\varnothing d_2$	ℓ_1

Dimensional symbols of endmills

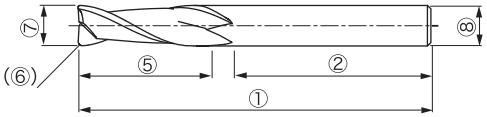
● Square endmills



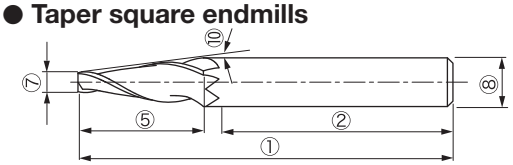
●Taper-neck ball endmills



● Radius endmills

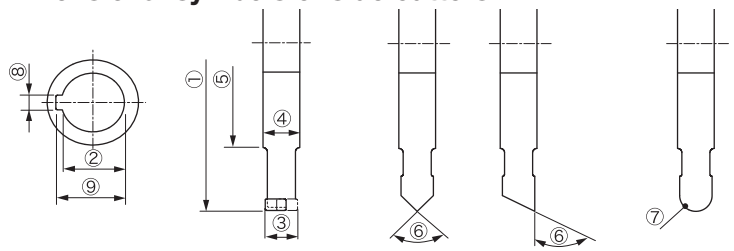


● Taper square endmills



①	②	③	④	⑤	⑥ Ball end	⑥ Radius end	⑦	⑧	⑨	⑩	⑪	⑫	⑬
Overall length	Shank length	Neck length	Length of parallel portion	Cutting edge length	Ball radius	Corner radius	Tool diameter	Shank diameter	Half angle of neck taper	Half angle of cutting edge taper	Neck diameter	Interference angle	Helix angle
L	ℓ_S	ℓ_2	ℓ_1	ℓ	R	r	$\varnothing D_c$	$\varnothing D_s$	θ_n	θ_c	$\varnothing D_1$	$\theta\kappa$	λ

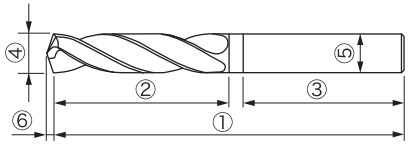
Dimensional symbols of side cutters



①	②	③	④	⑤
Cutter diameter	Bore diameter	Cutting edge width	Boss thickness	Boss diameter
$\varnothing D_c$	$\varnothing d$	ℓ	T	$\varnothing D_b$
⑥	⑦	⑧	⑨	⑩
Cutting edge angle	Corner radius	Key way width	Key way depth	Number of teeth
α	R	a	b	z

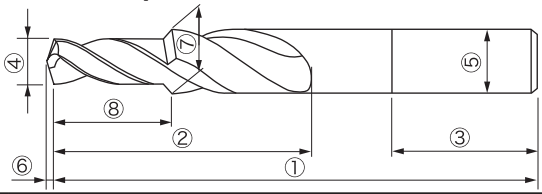
Dimensional symbols of drills

● Solid straight drills



①	②	③	④	⑤	⑥
Overall length	Flute length	Shank length	Drill diameter	Shank diameter	Point length
L	ℓ	ℓ_S	$\varnothing D_c$	$\varnothing D_s$	L_p

● Solid step drills



①	②	③	④	⑤	⑥	⑦	⑧
Overall length	Flute length	Shank length	First step drill diameter	Shank diameter	Point length	Second step drill diameter	Step length
L	ℓ	ℓ_S	$\varnothing D_c$	$\varnothing D_s$	L_p	$\varnothing D_{c2}$	ℓ_1