MillLine

SLOTMILL SERIES

www.tungaloyamerica.com

Tungaloy Report No. 423-US

SLOTMILL SERIES

Stable slot milling operation with **excellent chip control!**

Member IMC Group Tungaloy


ACCELERATED MACHINING

MillLine

SLOTMILL SERIES

TUNGALOY

TUNG FORCE MILL

ACCELERATED MACHINING

Tungaloy SlotMill Series is an **economical and well-designed** slot milling line for improved surface finish in slotting, face milling, and back-face milling.

SLOTMILL SERIES

TUNGALOY

An **economical** slot milling solution with stable chip formation allowing deeper slots therefore **increasing productivity** and **stability** in machining!

Exceptional chip evacuation

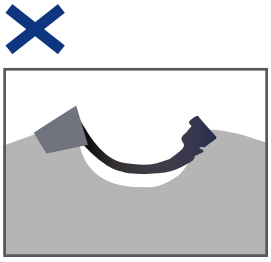
Offers stable deep slot milling!

SLOTMILL SERIES

OK

Optimum chipbreaker and big gullets create compact chip formation and smooth evacuation!

Competitor



Unformed chip and narrow gullet cause chip packing.

Innovative inserts

Tough cutting edges lead to high stability

TUNGMINISLIT **S/ASG** type

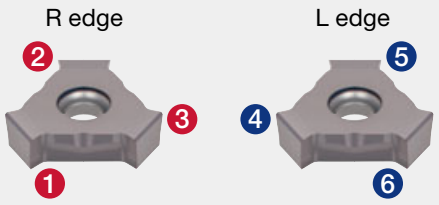
For parting-off and thin slotting
Precision insert (*W*±0.002")

W = 0.063", 0.073", 0.104", 0.157"

TUNGTHINSLIT **ASV** type

6 corners available

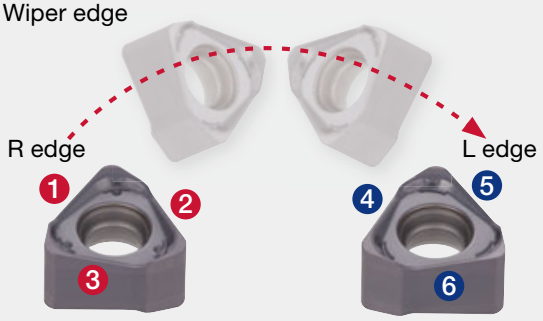
W = 0.250", 0.313"



TUNGUNIVERSALSLOT **ASW / TSW** type

6 corners available
With Wiper edge

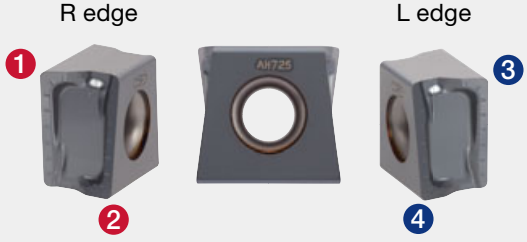
W = 0.375", 0.500", 0.625"



TECTANGENTIALSLOT **ASN / TSN** type

4 corners available
With Wiper edge

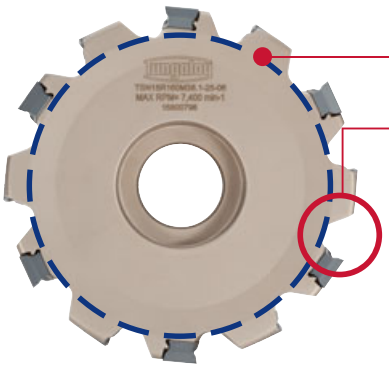
W = 0.630", 0.748", 0.984"



High productivity due to a large number of cutting edges

- High density insert cutters for TungThinSlit, TungUniversalSlot, TecTangentialSlot!
- 1.3 - 1.7 times higher productivity than conventional tools

Sample: TECTSLOT TANGENTIAL



Highly rigid cutter body with tangential insert

Excellent chip evacuation with an optimized chip gullet

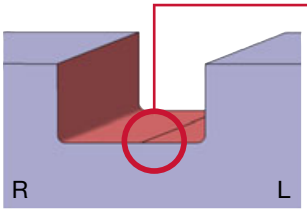
Comparison of no. of cutting edges (Edge width: *W* = 0.630")

Tool dia. øDc (in)	TECTSLOT TANGENTIAL	Competitor A	Competitor B
ø3.937	5	-	3
ø4.921	6	5	4
ø6.299	7	6	5
ø7.874	8	7	6

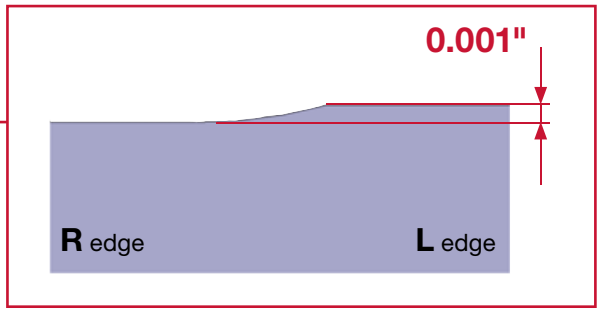
Small gap between R edge and L edge

Reduced runout due to the ground inserts

Machining example: TECTSLOT TANGENTIAL



Workpiece



Tool diameter	: ø*D*c = ø4.921"
Workpiece	: 1055 (200HB)
Cutting speed	: *V*c = 500 sfm
Chip thickness	: t = 0.005"
Edge width	: *W* = 0.630"
Depth of slot	: *a*e = 0.236"
Machine	: Vertical M/C, CAT50

*Dimension shown is under ideal condition.

CUTTING PERFORMANCE

Comparison of chip control

Smooth chip evacuation!
Better than conventional tools!

Tool diameter : ø*Dc* = ø4.921"
Cutting speed : *Vc* = 500 sfm
Chip thickness : t = 0.004"
No. of cutting edges : 1 cutting edge
Machine : Vertical M/C, CAT50

Feed per cutting edge : *fz* = 0.008 ipt (ae = 0.394")
fz = 0.006 ipt (ae = 0.788")
fz = 0.005 ipt (ae = 1.182")

TUNGTSLIT ASV type

O : Good ✕ : Bad, chip packing

P **Steel** 1055 (200HB)
Edge width: *W* = 4 mm (0.157"), Dry (with air)
Corner radius: r_ε = 0.4 mm (0.016")

Cutter	Depth of slot: *ae* mm(in)		
	10 (0.394")	20 (0.788")	25 (0.984")
TUNGTSLIT	O	O	O
Competitor A	O	O	✕
Competitor B	O	✕	✕

Chips at *ae* = 25 mm (0.984") depth

Competitor A

Packed chips

Competitor B

No chip control

M **Stainless** 304 (180HB)
Edge width: *W* = 0.250", Wet
Corner radius: r_ε = 0.031"

Cutter	Depth of slot: *ae* (in)		
	0.394	0.788	1.182
TUNGTSLIT	O	O	O
Competitor A	O	✕	✕

Chips at *ae* = 1.182" depth

Competitor A

Packed chips

TUNGUSLOT ASW / TSW type

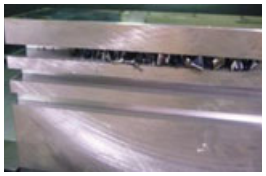
P **Steel** 1055 (200HB)
Edge width: *W* = 0.375", Dry
Corner radius: r_ε = 0.031"

Cutter	Depth of slot: *ae* (in)		
	0.394	0.788	1.182
TUNGUSLOT	O	O	O
Competitor A	O	O	✕

Chips at *ae* = 1.182" depth

Competitor A

Packed chips



Chips are packed because of bad chip control and flow.

Comparison of tool life

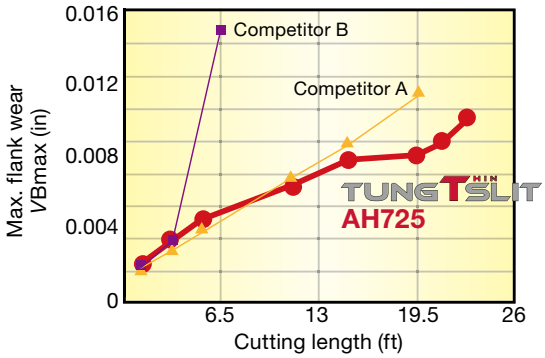
Longer tool life than competitors tools!

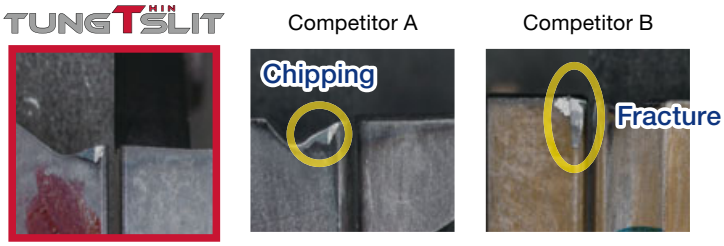
Tool diameter : øDc = ø4.921"
Cutting speed : Vc = 500 sfm
Chip thickness : t = 0.004"

Feed per edge line : fz = 0.008 ipt
Depth of slot: ae = 0.394"
No. of cutting edge: 1 cutting edge
Machine : Vertical M/C, CAT50

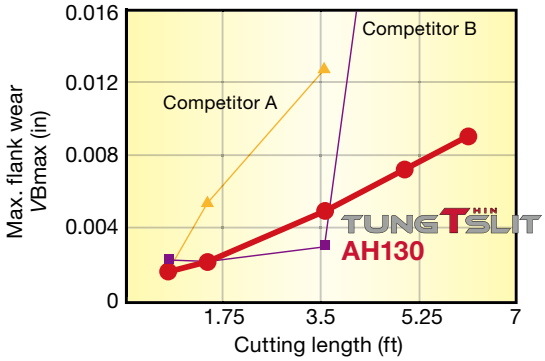
TUNGTHINSLIT ASV type

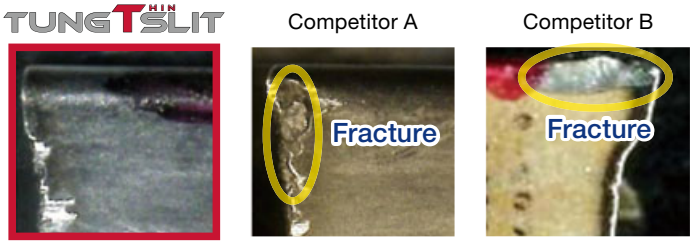
P **Steel** 1055 (200HB)
Edge width: *W* = 4 mm (0.157"), Dry
Corner radius: r_ε = 0.4 mm (0.016")





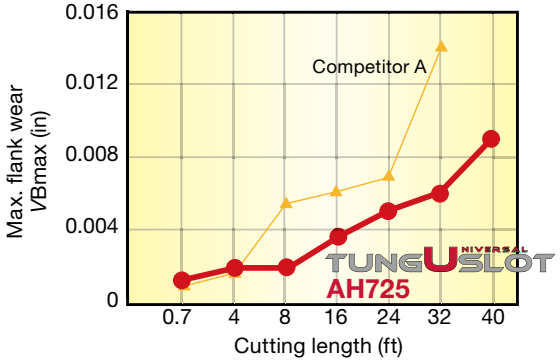
M **Stainless** 304 (180HB)
Edge width: *W* = 0.250", Wet
Corner radius: r_ε = 0.031"

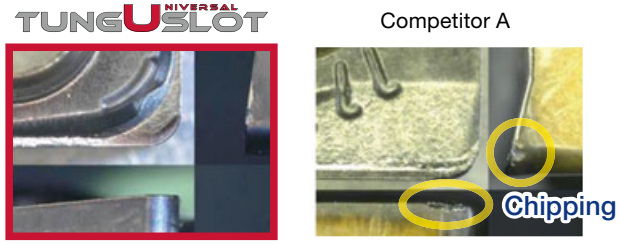




TUNGUNIVERSALSLOT ASW / TSW type

P **Steel** 1055 (200HB)
Edge width: *W* = 0.375", Dry
Corner radius: r_ε = 0.031"





Comparison of tool life

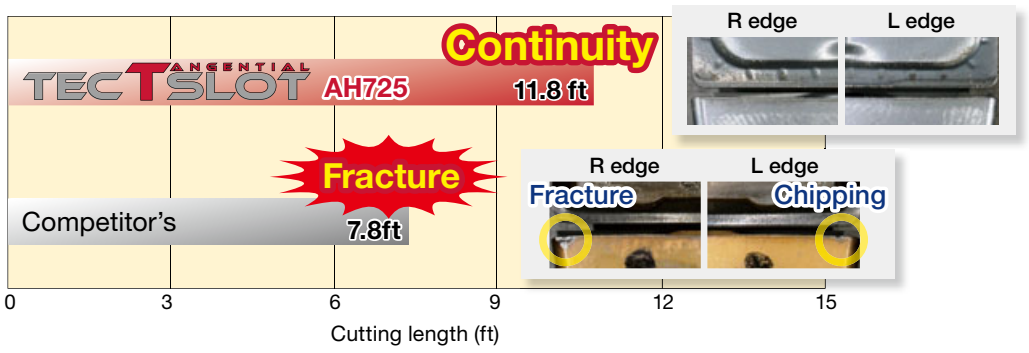
Reliable insert with tough cutting edge!

TECTSLOT TANGENTIAL ASN / TSN type

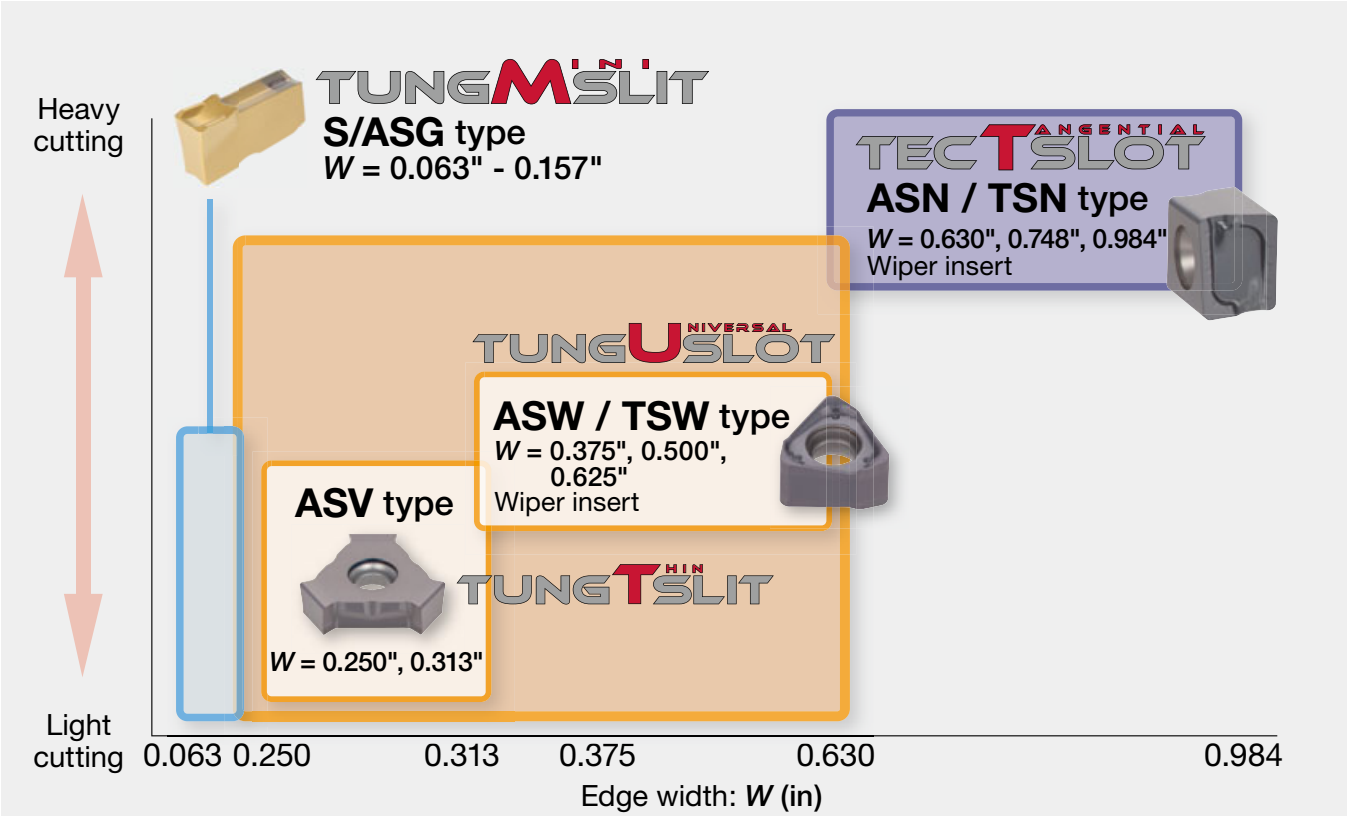
P **Steel** 1055 (200HB)
Edge width: W = 0.630", Dry
Corner radius: r_ε = 0.031"

Tool diameter : øDc = ø4.921"
Cutting speed : Vc = 500 sfm
Chip thickness : t = 0.008"
Feed per cutting edge : fz = 0.012 ipt

Edge width : W = 0.630"
Depth of slot : ae = 0.630"
No. of cutting edges : 1 cutting edge:
Machine Vertical M/C, CAT50



APPLICATION RANGE

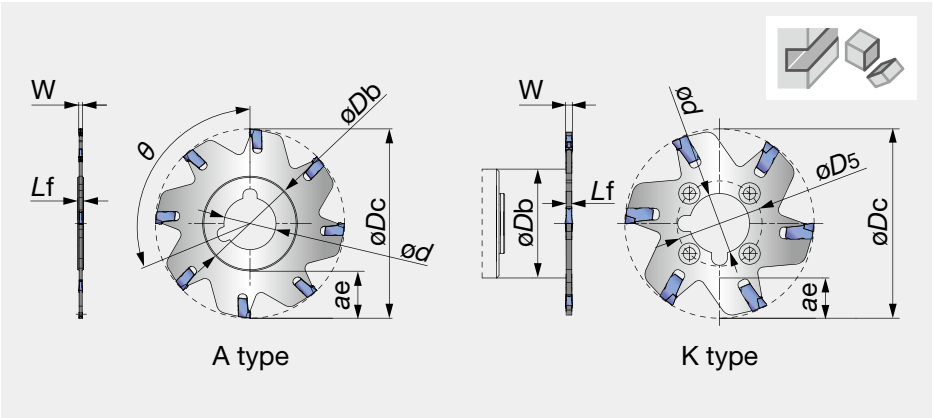


TUNGMINISLIT
TUNGALOY

Side cutter for thin slitting and cutting off

CUTTER - AXIAL DRIVE

TungMiniSlit S/ASG



Designation	W min	W max	øDc	z	øDb	ød	øD5	Lf	Max. ae	0°	SS	Drive flange	type	Insert
SSG01R063-E1.6	0.063	0.063	2.480	6	1.260	0.394	0.866	0.094	0.551	0	SW25-32 / SW1.00-32	-	K	SSS16N
ASG01N076-1.6	0.063	0.063	3.000	8	1.535	1.000	-	0.094	0.551	112.5	-	-	A	SSS16N
ASG01N100-1.6	0.063	0.063	3.937	10	1.535	1.000	-	0.094	1.181	90	-	-	A	SSS16N
ASG01N125-1.6	0.063	0.063	4.921	12	2.520	1.250	-	0.094	1.181	75	-	-	A	SSS16N
SSG02R063-E2	0.073	0.098	2.480	6	1.260	0.394	0.866	0.094	0.591	0	SW25-32 / SW1.00-32	-	K	SSM/S22N
ASG02N076-2	0.073	0.098	3.000	8	1.535	1.000	-	0.094	0.669	112.5	-	-	A	SSM/S22N
ASG02N100-2	0.073	0.098	3.937	10	1.535	1.000	-	0.094	1.181	90	-	-	A	SSM/S22N
ASG02N125-2	0.073	0.098	4.921	12	2.362	1.250	-	0.094	1.260	75	-	-	A	SSM/S22N
SSG03R063-E3	0.104	0.138	2.480	5	1.260	0.394	0.866	0.094	0.591	0	SW25-32 / SW1.00-32	-	K	SSM/S31N
SSG03R080-3	0.104	0.138	3.150	6	1.811	1.000	1.417	0.094	0.630	0	SW32-25.4-46-J / SW1.25-46	R1.00-46	K	SSM/S31N
SSG03R100-3	0.104	0.138	3.937	6	1.811	1.000	1.417	0.094	1.024	0	SW32-25.4-46-J / SW1.25-46	R1.00-46	K	SSM/S31N
SSG03R100-E3	0.104	0.138	3.937	6	1.575(1)	0.866	1.260	0.094	1.142(2)	0	SW32-40	R22-46	K	SSM/S31N
SSG03R125-3	0.104	0.138	4.921	8	2.165	1.250	1.772	0.094	1.339	0	S1.25-55	R1.25-55	K	SSM/S31N
SSG04R063-E4	0.157	0.177	2.480	5	1.260	0.394	0.866	0.126	0.591	0	SW25-32 / SW1.00-32	-	K	SSM/S41N
SSG04R080-4	0.157	0.177	3.150	6	1.811	1.000	1.417	0.126	0.630	0	SW32-25.4-46-J / SW1.25-46	R1.00-46	K	SSM/S41N
SSG04R100-4	0.157	0.177	3.937	6	1.811	1.000	1.417	0.126	1.024	0	SW32-25.4-46-J / SW1.25-46	R1.00-46	K	SSM/S41N
SSG04R125-4	0.157	0.177	4.921	8	2.165	1.250	1.772	0.126	1.339	0	S1.25-55	R1.25-55	K	SSM/S41N

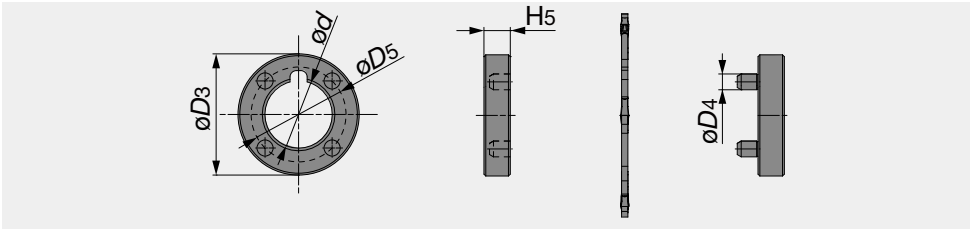
(1) When using a drive flange, øDb = 1.811"
(2) When using a drive flange, Max. ae = 1.024"

SPARE PARTS

Designation	Grip	Extractor
SSG01/02...	ESG0.5	-
ASG01/02...	ESG0.5	-
SSG03/04...	-	ESG1

R (drive flange set)

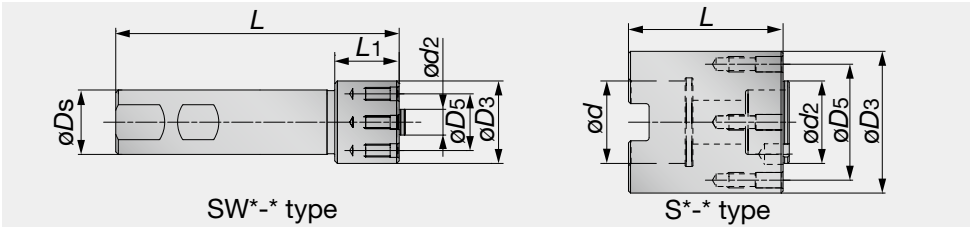
Drive flange set for side cutters



Designation	ød	øD3	øD4	øD5	H5
R1.00-46	1.000	1.811	0.197	1.417	0.394
R 22-46	0.866	1.811	0.236	1.260	0.394
R1.25-55	1.250	2.165	0.236	1.772	0.394
R 32-55	1.260	2.165	0.236	1.772	0.394

SW/S

Drive shanks for side cutters



Designation	øDs	ød	ød2	øD3	øD5	L1	L
SW25-32	0.984	-	0.394	1.260	0.866	0.984	4.331
SW32-40	1.260	-	0.866	1.575	1.260	1.181	4.724
SW32-25.4-46-J	1.260	-	1.000	1.811	1.417	1.181	4.724
SW1.00-32	1.000	-	0.394	1.260	0.866	1.000	4.331
SW1.25-46	1.250	-	1.000	1.811	1.417	1.181	4.724
S1.25-55	-	1.250	1.250	2.165	1.772	-	2.362
S 32-55	-	1.260	1.260	2.165	1.772	-	2.362

SPARE PARTS




Designation	Screw	Wrench		
		Mono block type	Torx bit	Handle
SW25-32	SR76-961	SETT-15/5	-	-
SW32-40	SR76-963	SETT-15/5	-	-
SW32-25.4-46-J	SR76-963	SETT-15/5	-	-
SW1.00-32	SR76-961	SETT-15/5	-	-
SW1.25-46	SR76-963	SETT-15/5	-	-
S1.25-55	SR76-943	-	BT20M	H-TB
S32-55	SR76-943	-	BT20M	H-TB

COMBINATION OF ARBORS / ATTACHMENTS

Cutter bodies : “A” type

A-type disk cutters do not have clamping holes on the hub and can be mounted only by using axial drive arbors.

Axial drive arbor

Cutter bodies : “K” type

K-type disk cutters have clamping holes on the hub and can be mounted by using intermediate shanks or shell adaptors, making it possible to use endmills / shell mill arbors.

Drive flange

Axial drive arbor

Shank adaptor

Shell adaptor

Shell mill / Endmill arbor

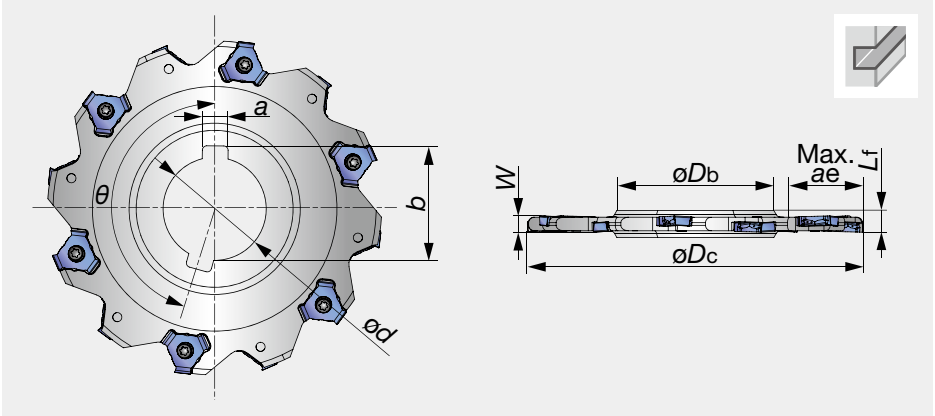
Tool dia.	ø2.480"	ø3.150"	ø3.937"	ø4.921"
Drive flange	-	✔	✔	✔
Shank / Shell adaptor	✔	✔	✔	✔

TUNGTHIN SLIT
TUNGALOY

Axial drive type slot milling cutter with face mounted inserts

CUTTER - AXIAL DRIVE

TungThinSlit ASV + TVKX

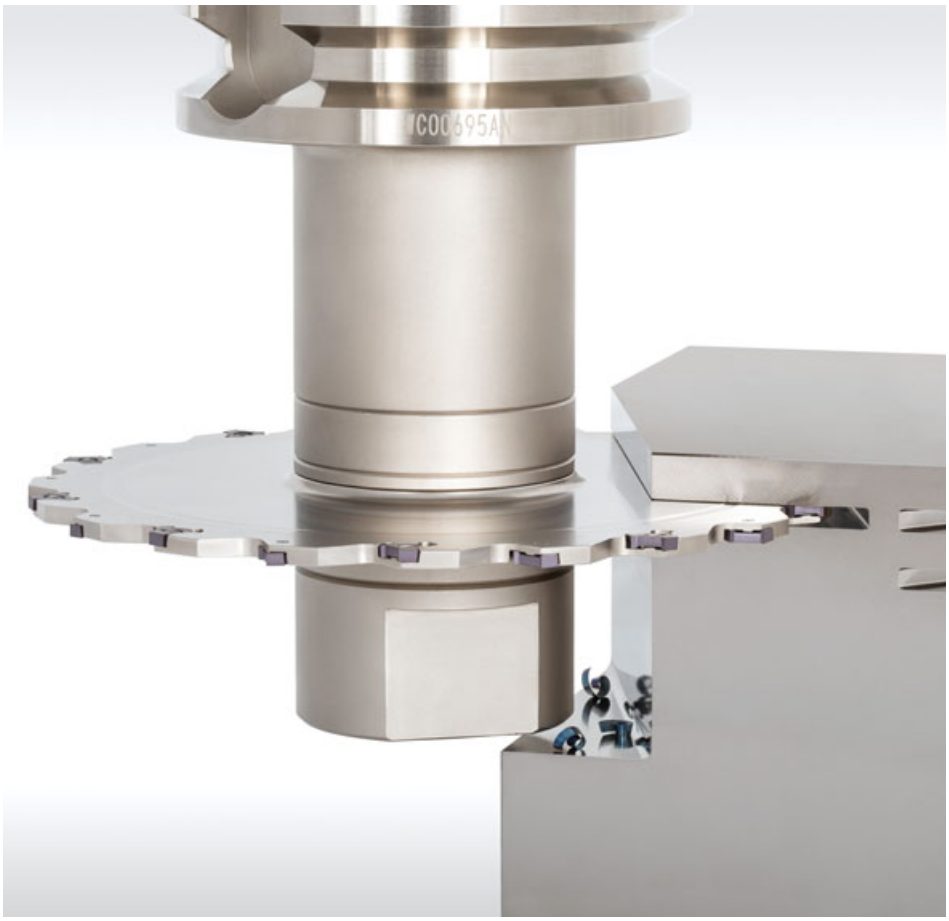


Designation	*W*	*øDc*	Z eff	*øDb*	*ød*	*Lf*	*b*	*a*	Max. *ae*	0	z	Insert
ASV04N300-U025	0.250	3.000	4	1.614	1.000	0.394	1.102	0.250	0.595	157.5°	8	TVKX04H3**
ASV04N400-U025	0.250	4.000	5	1.890	1.250	0.394	1.386	0.312	0.957	162°	10	TVKX04H3**
ASV04N500-U025	0.250	5.000	6	2.283	1.500	0.394	1.665	0.375	1.260	165°	12	TVKX04H3**
ASV04N600-U025	0.250	6.000	8	2.283	1.500	0.394	1.665	0.375	1.760	168.75°	16	TVKX04H3**
ASV04N800-U025	0.250	8.000	10	2.717	2.000	0.394	2.197	0.500	2.543	171°	20	TVKX04H3**
ASV05N300-U031	0.313	3.000	4	1.614	1.000	0.472	1.102	0.250	0.595	157.5°	8	TVKX0504**
ASV05N400-U031	0.313	4.000	5	1.890	1.250	0.472	1.386	0.312	0.957	162°	10	TVKX0504**
ASV05N500-U031	0.313	5.000	6	2.283	1.500	0.472	1.665	0.375	1.260	165°	12	TVKX0504**
ASV05N600-U031	0.313	6.000	8	2.283	1.500	0.472	1.665	0.375	1.760	168.75°	16	TVKX0504**
ASV05N800-U031	0.313	8.000	10	2.717	2.000	0.472	2.197	0.500	2.543	171°	20	TVKX0504**

SPARE PARTS




Designation	Clamping screw	Wrench		
		Mono block type	Bit	Grip
ASV04N...	SR14-500-L5.1	-	BT15S	H-TBS
ASV05N...	SR14-500-L7.0	-	BT15S	H-TBS

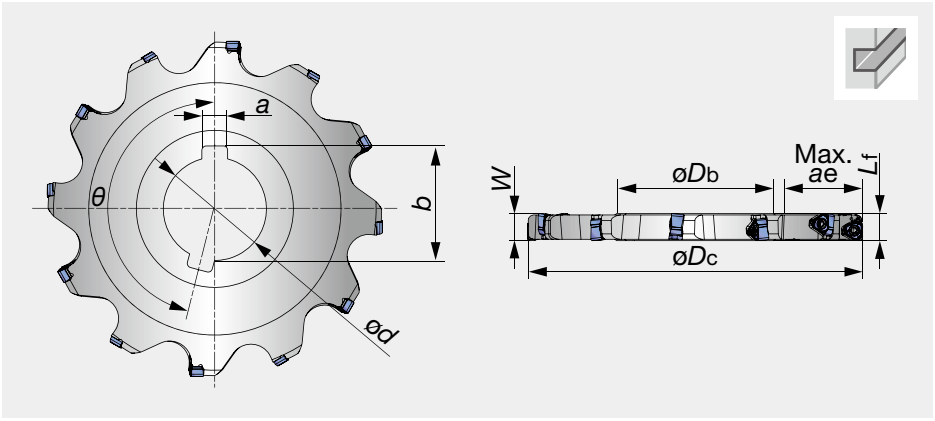


TUNGUNIVERSALSLOT
TUNGALOY

Axial drive type slot milling cutter

CUTTER - AXIAL DRIVE

TungUniversalSlot ASW + WNGU



Designation	*W*	*øDc*	Z eff	*øDb*	*ød*	*Lf*	*b*	*a*	Max. *ae*	0	z	Insert
ASW06N300-U037	0.375	3.000	4	1.614	1.000	0.375	1.102	0.250	0.654	157.5°	8	WNGU0603**
ASW06N400-U037	0.375	4.000	5	1.890	1.250	0.375	1.386	0.312	1.016	162°	10	WNGU0603**
ASW06N500-U037	0.375	5.000	6	2.283	1.500	0.375	1.665	0.375	1.319	165°	12	WNGU0603**
ASW06N600-U037	0.375	6.000	7	2.283	1.500	0.375	1.665	0.375	1.819	167.14°	14	WNGU0603**
ASW07N400-U050	0.500	4.000	5	1.890	1.250	0.500	1.386	0.312	1.016	162°	10	WNGU07T3**
ASW07N500-U050	0.500	5.000	6	2.283	1.500	0.500	1.665	0.375	1.319	165°	12	WNGU07T3**
ASW07N600-U050	0.500	6.000	7	2.283	1.500	0.500	1.665	0.375	1.819	167.14°	14	WNGU07T3**
ASW09N600-U062	0.625	6.000	7	2.283	1.500	0.625	1.665	0.375	1.819	167.14°	14	WNGU0904**

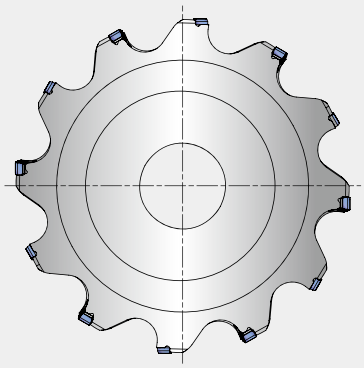
SPARE PARTS

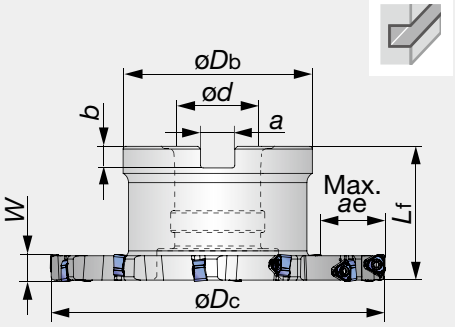
Designation	Clamping screw		Wrench				Lubricant
			Mono block type	Bit	Grip		
ASW06N...	CSPB-2.5	-	IP-8D	-	-	-	M-1000
ASW07N400...	CSPD-3	-	-	BLD IP10/S7	SW6-SD	-	M-1000
ASW07N500...	CSPD-3	-	-	BLD IP10/S7	SW6-SD	-	M-1000
ASW07N600...	CSPD-3	-	IP-10D	-	-	-	M-1000
ASW09N400...	-	CSPB-3.5	-	BLD IP15/S7	-	H-TBS	M-1000
ASW09N600...	-	CSPB-3.5	IP-15D	-	-	-	M-1000

Radial drive type slot milling cutter

CUTTER - RADIAL DRIVE

TungUniversalSlot TSW + WNGU





Designation	*W*	*øDc*	Z eff	*øDb*	*ød*	*Lf*	*a*	*b*	Max. *ae*	z	Insert
TSW06R400-U037	0.375	4.000	5	1.969	1.000	1.969	0.236	0.374	0.976	10	WNGU0603**
TSW06R500-U037	0.375	5.000	6	2.756	1.250	1.969	0.315	0.500	1.083	12	WNGU0603**
TSW06R600-U037	0.375	6.000	7	3.937	1.500	2.480	0.394	0.626	0.992	14	WNGU0603**
TSW07R400-U050	0.500	4.000	5	1.969	1.000	1.969	0.236	0.374	0.976	10	WNGU07T3**
TSW07R500-U050	0.500	5.000	6	2.756	1.250	1.969	0.315	0.500	1.083	12	WNGU07T3**
TSW07R600-U050	0.500	6.000	7	3.937	1.500	2.480	0.394	0.626	0.992	14	WNGU07T3**
TSW09R600-U062	0.625	6.000	7	3.937	1.500	2.480	0.394	0.626	0.992	14	WNGU0904**

SPARE PARTS





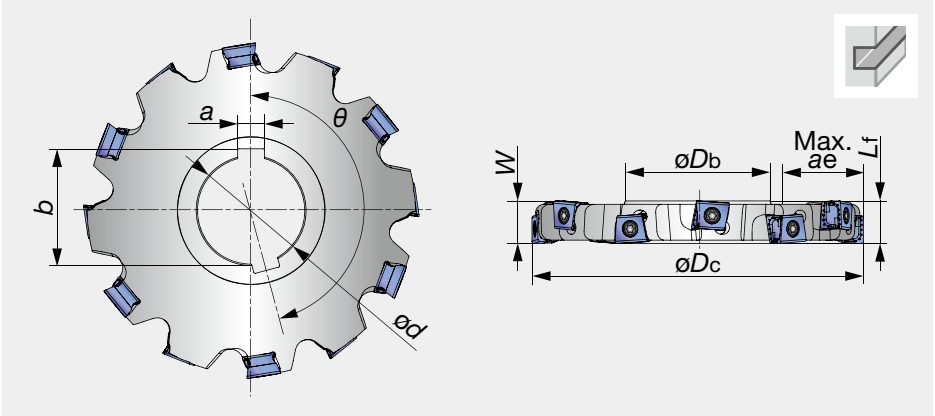

Designation	Clamping screw		Wrench			Lubricant
			Mono block type	Bit	Grip	
TSW06R...	CSPB-2.5	-	IP-8D	-	-	M-1000
TSW07R400...	CSPD-3	-	-	BLD IP10/S7	SW6-SD	M-1000
TSW07R500...	CSPD-3	-	-	BLD IP10/S7	SW6-SD	M-1000
TSW07R600...	CSPD-3	-	IP-10D	-	-	M-1000
TSW09R...	-	CSPB-3.5	IP-15D	-	-	M-1000

TANGENTIAL TECTSLOT TUNGALOY

Axial drive type slot milling cutter with tangentially mounted inserts

CUTTER - AXIAL DRIVE

TecTangentialSlot ASN + LMEU



Designation	*W*	*øDc*	Z eff	*øDb*	*ød*	*Lf*	*b*	*a*	Max. *ae*	0	z	Insert
ASN10R100M31.7-16-05	0.630	3.937	5	1.890	1.250	0.630	1.386	0.312	0.984	162°	10	LMEU1008**
ASN10R125M38.1-16-06	0.630	4.921	6	2.283	1.500	0.630	1.665	0.375	1.280	165°	12	LMEU1008**
ASN10R160M38.1-16-07	0.630	6.299	7	2.283	1.500	0.630	1.665	0.375	1.969	167.14°	14	LMEU1008**
ASN12R100M31.7-19-05	0.748	3.937	5	1.890	1.250	0.748	1.386	0.312	0.984	162°	10	LMEU1208**
ASN12R125M38.1-19-06	0.748	4.921	6	2.283	1.500	0.748	1.665	0.375	1.280	165°	12	LMEU1208**
ASN12R160M38.1-19-07	0.748	6.299	7	2.283	1.500	0.748	1.665	0.375	1.969	167.14°	14	LMEU1208**
ASN15R125M38.1-25-05	0.984	4.921	5	2.283	1.500	0.984	1.665	0.375	1.280	162°	10	LMEU1509**
ASN15R160M38.1-25-06	0.984	6.299	6	2.283	1.500	0.984	1.665	0.375	1.969	165°	12	LMEU1509**

SPARE PARTS

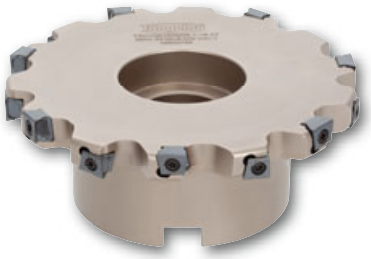


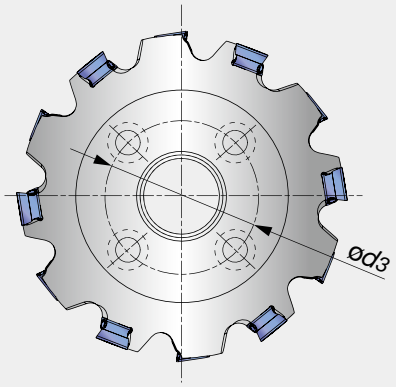
Designation	Clamping screw	Wrench	
		Bit	Grip
ASN10R...	SM40-143-H0	BT15S	H-TB
ASN12R...	SM40-143-H0	BT15S	H-TB
ASN15R...	CSTB-5L159	BT20S	H-TB

Radial drive type slot milling cutter with tangentially mounted inserts

CUTTER - RADIAL DRIVE

TecTangentialSlot TSN + LMEU





Designation	*W*	*øDc*	Z eff	*øDb*	*ød*	*Lf*	*b*	*a*	Max. *ae*	*ød3*	z	Insert
TSN10R100M25.4-16-05	0.630	3.937	5	1.969	1.000	1.969	0.236	0.374	0.945	-	10	LMEU1008**
TSN10R125M31.7-16-06	0.630	4.921	6	2.756	1.250	1.969	0.315	0.500	1.043	-	12	LMEU1008**
TSN10R160M38.1-16-07	0.630	6.299	7	3.937	1.500	2.480	0.394	0.626	1.142	-	14	LMEU1008**
TSN10R200M47.6-16-08	0.630	7.874	8	5.315	1.875	2.480	0.551	1.000	1.240	4.000	16	LMEU1008**
TSN12R100M25.4-19-05	0.748	3.937	5	1.969	1.000	1.969	0.236	0.374	0.945	-	10	LMEU1208**
TSN12R125M31.7-19-06	0.748	4.921	6	2.756	1.250	1.969	0.315	0.500	1.043	-	12	LMEU1208**
TSN12R160M38.1-19-07	0.748	6.299	7	3.937	1.500	2.480	0.394	0.626	1.142	-	14	LMEU1208**
TSN12R200M47.6-19-08	0.748	7.874	8	5.315	1.875	2.480	0.551	1.000	1.240	4.000	16	LMEU1208**
TSN12R250M47.6-19-09	0.748	9.843	9	5.512	1.875	2.480	0.551	1.000	2.126	4.000	18	LMEU1208**
TSN15R125M31.7-25-05	0.984	4.921	5	2.756	1.250	1.969	0.315	0.500	1.043	-	10	LMEU1509**
TSN15R160M38.1-25-06	0.984	6.299	6	3.937	1.500	2.480	0.394	0.626	1.142	-	12	LMEU1509**
TSN15R200M50.8-25-07	0.984	7.874	7	5.315	2.000	2.480	0.551	1.000	1.240	4.000	14	LMEU1509**
TSN15R250M63.5-25-08	0.984	9.843	8	5.512	2.500	2.480	0.551	1.000	2.126	4.000	16	LMEU1509**

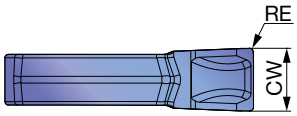
SPARE PARTS



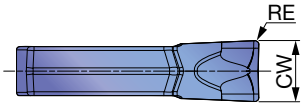
Designation	Clamping screw	Wrench	
		Bit	Grip
TSN10R...	SM40-143-H0	BT15S	H-TB
TSN12R...	SM40-143-H0	BT15S	H-TB
TSN15R...	CSTB-5L159	BT20S	H-TB

INSERTS

SSM



SSS



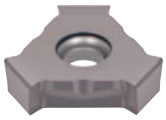
P	Steel	★
M	Stainless	★
K	Cast iron	★
N	Non-ferrous	
S	Superalloys	
H	Hard materials	

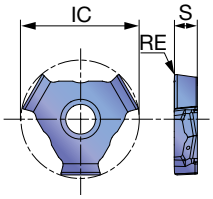
★ : First choice
☆ : Second choice

Designation	RE	Coated	CW±0.04
		GH130	
SSM22N	0.008	●	0.087
SSM31N	0.008	●	0.122
SSM41N	0.010	●	0.161
SSS16N	0.006	●	0.063
SSS22N	0.008	●	0.087
SSS31N	0.008	●	0.122
SSS41N	0.010	●	0.161

● : Line up

TVKX-MJ





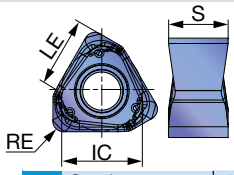
P	Steel	☆		★
M	Stainless		★	☆
K	Cast iron	★		☆
N	Non-ferrous			
S	Superalloys	★	☆	★
H	Hard materials			

★ : First choice
☆ : Second choice

Designation	RE	Coated			S	IC
		AH120	AH130	AH725		
TVKX020202TN-MJ	0.008	●		●	0.094	0.370
TVKX020204TN-MJ	0.016	●		●	0.094	0.370
TVKX03X302TN-MJ	0.008	●		●	0.126	0.370
TVKX03X304TN-MJ	0.016	●		●	0.126	0.370
TVKX04H304TN-MJ	0.016	●	●	●	0.138	0.665
TVKX04H308TN-MJ	0.031	●	●	●	0.138	0.665
TVKX050404TN-MJ	0.016	●	●	●	0.177	0.665
TVKX050408TN-MJ	0.031	●	●	●	0.177	0.665

● : Line up

WNGU-MJ



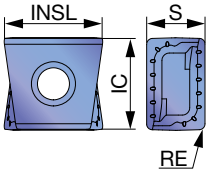
P	Steel	☆		★	★
M	Stainless		★	☆	★
K	Cast iron	★		☆	
N	Non-ferrous				
S	Superalloys	★	☆	★	
H	Hard materials				

★ : First choice
☆ : Second choice

Designation	RE	Coated				LE	IC	S
		AH120	AH130	AH725	AH3135			
WNGU060304TN-MJ	0.016	●			●	0.220	0.240	0.173
WNGU060308TN-MJ	0.031	●	●	●	●	0.220	0.240	0.173
WNGU060310TN-MJ	0.039	●			●	0.220	0.240	0.173
WNGU060316TN-MJ	0.063	●	●	●		0.220	0.240	0.173
WNGU060320TN-MJ	0.079	●			●	0.220	0.240	0.173
WNGU07T304TN-MJ	0.016	●			●	0.268	0.291	0.217
WNGU07T308TN-MJ	0.031	●	●	●		0.268	0.291	0.217
WNGU07T310TN-MJ	0.039	●			●	0.268	0.291	0.217
WNGU07T316TN-MJ	0.063	●	●	●		0.268	0.291	0.217
WNGU07T320TN-MJ	0.079	●			●	0.268	0.291	0.217
WNGU090404TN-MJ	0.016	●			●	0.335	0.339	0.256
WNGU090408TN-MJ	0.031	●	●	●		0.335	0.339	0.256
WNGU090410TN-MJ	0.039	●			●	0.335	0.339	0.256
WNGU090416TN-MJ	0.063	●	●	●		0.335	0.339	0.256
WNGU090420TN-MJ	0.079	●			●	0.335	0.339	0.256

● : Line up

LMEU-MJ



P	Steel	☆		☆	★
M	Stainless		☆	☆	★
K	Cast iron	★		☆	
N	Non-ferrous				
S	Superalloys	★		★	
H	Hard materials				

★ : First choice
☆ : Second choice

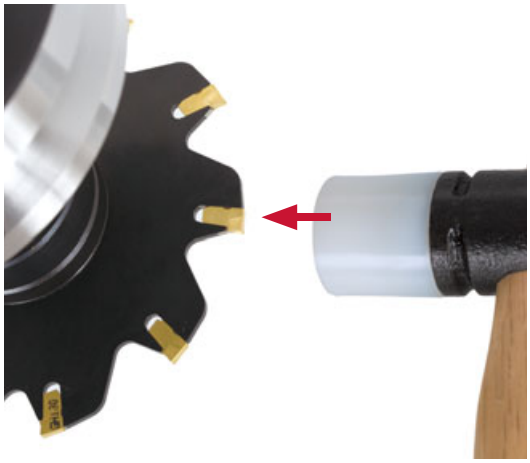
Designation	RE	Coated				INSL	IC	S
		AH120	AH140	AH725	AH3135			
LMEU100808ZNEN-MJ	0.031	●	●	●	●	0.500	0.413	0.315
LMEU100810ZNEN-MJ	0.039	●			●	0.500	0.413	0.315
LMEU100816ZNEN-MJ	0.063	●	●	●	●	0.492	0.413	0.315
LMEU100820ZNEN-MJ	0.079	●			●	0.488	0.413	0.315
LMEU100824ZNEN-MJ	0.094	●	●	●	●	0.488	0.413	0.315
LMEU100830ZNEN-MJ	0.118	●			●	0.480	0.413	0.315
LMEU100832ZNEN-MJ	0.126	●	●	●	●	0.480	0.413	0.315
LMEU120808ZNEN-MJ	0.031	●	●	●	●	0.535	0.500	0.315
LMEU120816ZNEN-MJ	0.063	●	●	●	●	0.528	0.500	0.315
LMEU120820ZNEN-MJ	0.079	●			●	0.524	0.500	0.315
LMEU120824ZNEN-MJ	0.094	●	●	●	●	0.520	0.500	0.315
LMEU120830ZNEN-MJ	0.118	●			●	0.516	0.500	0.315
LMEU120832ZNEN-MJ	0.126	●	●	●	●	0.516	0.500	0.315
LMEU150908ZNEN-MJ	0.031	●	●	●	●	0.614	0.591	0.374
LMEU150916ZNEN-MJ	0.063	●	●	●	●	0.606	0.591	0.374
LMEU150920ZNEN-MJ	0.079	●			●	0.606	0.591	0.374
LMEU150924ZNEN-MJ	0.094	●	●	●	●	0.602	0.591	0.374
LMEU150930ZNEN-MJ	0.118	●			●	0.598	0.591	0.374
LMEU150932ZNEN-MJ	0.126	●	●	●	●	0.594	0.591	0.374
LMEU150940ZNEN-MJ*	0.157	●			●	0.587	0.591	0.374
LMEU150950ZNEN-MJ*	0.197	●			●	0.579	0.591	0.374

* Please note that LMEU150940 and LMEU150950 inserts are for special cutter bodies only and do not fit standard versions.

● : Line up

INSERT INSTALLATION AND REMOVAL

Installation



Before installing inserts, clear chips and dust from the insert seats by air blast or cloth.

Lightly press the insert into the insert seat by hand, then use a plastic hammer to fix the insert in firmly into the position.

Make sure that there is no gap between the insert and the insert seat.

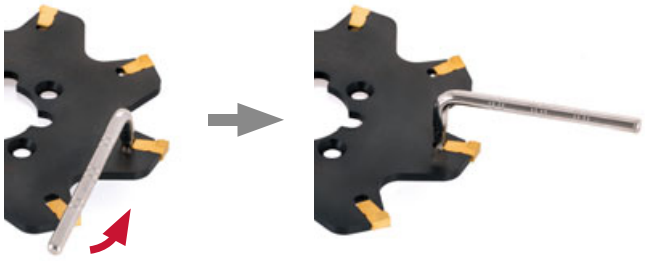
OK

Removal

SSG01/02 type

Insert the wrench (included in the package) in the hole and tilt the wrench in the arrowed direction.

SSG03/04 type



Insert the wrench in the hole and turn the wrench to the arrowed direction.

STANDARD CUTTING CONDITIONS

S/ASG type

ISO	Work piece materials	Hardness (HB)	Insert	Cutting speed Vc (sfm)	Chip thickness t (in)
P	Low carbon steel (1015, etc.)	- 200	SSM...	490 - 760	0.0020 - 0.006
	High carbon steel (1045, etc.)	200 - 300	SSM...	330 - 560	0.0016 - 0.005
	Alloy steel (4140, etc.)	150 - 300	SSM...	300 - 530	0.0016 - 0.005
	Tool steel (D2, etc.)	- 300	SSM...	230 - 390	0.0016 - 0.005
M	Stainless steel (304, etc.)	-	SSS...	300 - 660	0.0016 - 0.005
K	Gray cast iron (No250B, etc.)	150 - 250	SSM...	330 - 660	0.0020 - 0.006
	Ductile cast iron (65-45-12, etc.)	150 - 250	SSM...	260 - 430	0.0020 - 0.006

STANDARD CUTTING CONDITIONS

ASV, ASW / TSW, ASN / TSN type

ISO	Workpiece materials	Hardness	Priority	Grades	Cutting speed	Feed per edge line: fz (ipt) ASV ae / øDc (in)	
		(HB)			Vc (sfm)	10%	20%
P	Low carbon steel (1015, etc.)	- 200	First choice	AH725	300 - 590	0.0031 - 0.0098	0.0024 - 0.0075
		- 200	For impact resistance	AH130, AH140	300 - 590	0.0031 - 0.0098	0.0024 - 0.0075
	High carbon steel (1045, etc.)	200 - 300	First choice	AH725	300 - 590	0.0028 - 0.0087	0.0020 - 0.0063
		200 - 300	For impact resistance	AH130, AH140	300 - 590	0.0028 - 0.0087	0.0020 - 0.0063
	Alloy steel (4140, etc.)	150 - 300	First choice	AH725	300 - 590	0.0028 - 0.0087	0.0020 - 0.0063
		150 - 300	For impact resistance	AH130, AH140	300 - 590	0.0028 - 0.0087	0.0020 - 0.0063
	Tool steel (D2, etc.)	- 300	First choice	AH725	300 - 590	0.0028 - 0.0087	0.0020 - 0.0063
		- 300	For impact resistance	AH130, AH140	300 - 590	0.0028 - 0.0087	0.0020 - 0.0063
M	Stainless steel (304, etc.)	-	-	AH130, AH140	300 - 660	0.0028 - 0.0087	0.0020 - 0.0063
K	Gray cast iron (No250B, etc.)	150 - 250	-	AH120	390 - 760	0.0031 - 0.0098	0.0024 - 0.0075
	Ductile cast iron (65-45-12, etc.)	150 - 250	-	AH120	300 - 490	0.0031 - 0.0098	0.0024 - 0.0075
S	Titanium alloys (Ti-6Al-4V, etc.)	-	First choice	AH725	100 - 130	0.0028 - 0.0047	0.0020 - 0.0035
		-	For impact resistance	AH130	100 - 130	0.0028 - 0.0047	0.0020 - 0.0035
	Nickel-based alloys (Inconel718, etc.)	-	First choice	AH725	70 - 120	0.0028 - 0.0047	0.0020 - 0.0035
		-	For impact resistance	AH130	70 - 120	0.0028 - 0.0047	0.0020 - 0.0035

Chip thickness “t”

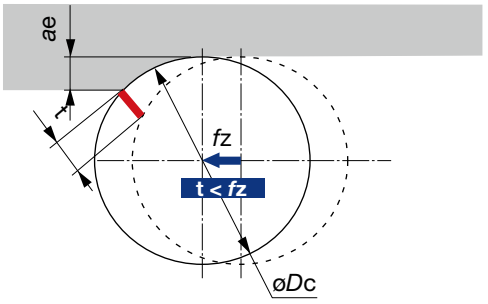
- Chip thickness “t” is one of the most important factors for chip evacuation in slot milling.
- Therefore, setup feed per edge line (*fz*) should be calculated according to chip thickness (t).

Slotting with a slot milling cutter

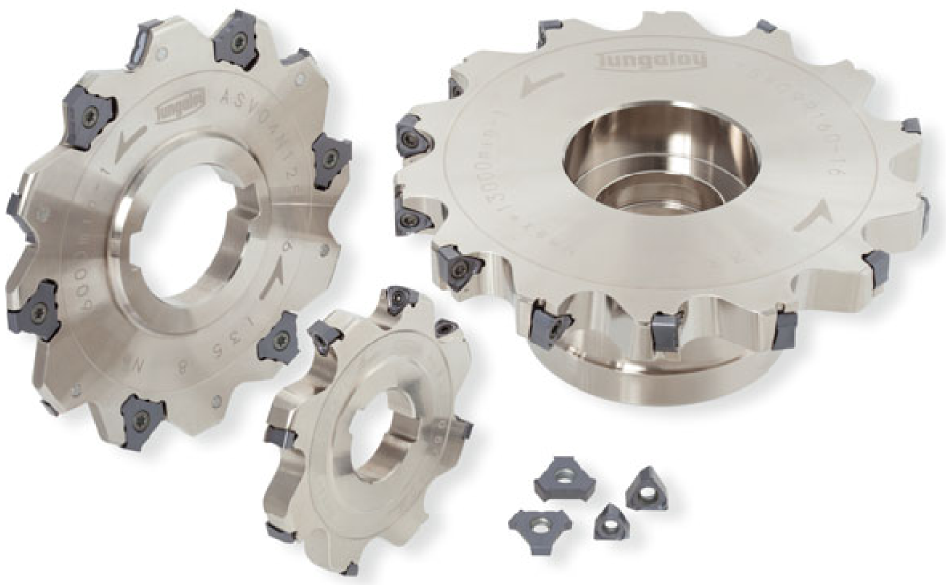
$$t = 2 \times fz \times \sqrt{(ae / øDc) \times (1 - (ae / øDc))}$$

$$fz = t / 2 / \sqrt{(ae / øDc) \times (1 - (ae / øDc))}$$

øDc : Tool diameter (in)
fz : Feed per edge line (ipt)
ae : Depth of slot (in)



Feed per edge line: fz (ipt)									
ASV		TSW / ASW				TSN / ASN			
ae / øDc (in)		ae / øDc (in)				ae / øDc (in)			
30%	≤ 50%	10%	20%	30%	≤ 50%	10%	20%	30%	≤ 50%
0.0020 - 0.0063	0.0020 - 0.0059	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
0.0020 - 0.0063	0.0020 - 0.0059	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
0.0016 - 0.0055	0.0016 - 0.0051	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
0.0016 - 0.0055	0.0016 - 0.0051	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
0.0016 - 0.0055	0.0016 - 0.0051	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
0.0016 - 0.0055	0.0016 - 0.0051	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
0.0016 - 0.0055	0.0016 - 0.0051	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
0.0016 - 0.0055	0.0016 - 0.0051	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
0.0016 - 0.0055	0.0016 - 0.0051	0.0047 - 0.0130	0.0035 - 0.0098	0.0028 - 0.0083	0.0028 - 0.0079	0.0087 - 0.0165	0.0063 - 0.0122	0.0055 - 0.0106	0.0051 - 0.0098
0.0020 - 0.0063	0.0020 - 0.0059	0.0047 - 0.0165	0.0035 - 0.0122	0.0028 - 0.0106	0.0028 - 0.0098	0.0087 - 0.0200	0.0063 - 0.0150	0.0055 - 0.0126	0.0051 - 0.0118
0.0020 - 0.0063	0.0020 - 0.0059	0.0047 - 0.0165	0.0035 - 0.0122	0.0028 - 0.0106	0.0028 - 0.0098	0.0087 - 0.0130	0.0063 - 0.0098	0.0055 - 0.0083	0.0051 - 0.0079
0.0016 - 0.0028	0.0016 - 0.0028	0.0039 - 0.0067	0.0031 - 0.0051	0.0024 - 0.0043	0.0024 - 0.0039	0.0047 - 0.0087	0.0035 - 0.0063	0.0028 - 0.0055	0.0028 - 0.0051
0.0016 - 0.0028	0.0016 - 0.0028	0.0039 - 0.0067	0.0031 - 0.0051	0.0024 - 0.0043	0.0024 - 0.0039	0.0047 - 0.0087	0.0035 - 0.0063	0.0028 - 0.0055	0.0028 - 0.0051
0.0016 - 0.0028	0.0016 - 0.0028	0.0039 - 0.0067	0.0031 - 0.0051	0.0024 - 0.0043	0.0024 - 0.0039	0.0047 - 0.0087	0.0035 - 0.0063	0.0028 - 0.0055	0.0028 - 0.0051
0.0016 - 0.0028	0.0016 - 0.0028	0.0039 - 0.0067	0.0031 - 0.0051	0.0024 - 0.0043	0.0024 - 0.0039	0.0047 - 0.0087	0.0035 - 0.0063	0.0028 - 0.0055	0.0028 - 0.0051



GUIDELINE FOR ORDERING SPECIAL TOOL

Tailor made cutters and inserts are available upon request. Please verify if your desired specification is possible from the table below. When requesting the quotation, please fill in the information sheet on the next page and send it to your local Tungaloy Sales Engineer.

■ Cutter

(A) Edge width: Depending on the edge width, insert type should be selected. (Please see Table #1 for detail.)
(B) Tool diameter: Depending on the insert type selected, tool diameter may be limited.
(C) Mount specification, bore diameter: For mount specification, axial drive or radial drive can be selected. If other specification is required, please provide the specification on the information sheet.

Tool designation can be determined with information A, B and C

Table #1: Available range of edge width and tool diameter

Edge width *W* (in)	Insert Designation	Tool Designation (tool shape)	Tool diameter range(2) ø*D*c (in)
0.157 - 0.177	TVKX02***	ASV02...	ø1.969 -
0.177 - 0.236	TVKX03***	ASV03...	ø1.969 -
0.236 - 0.291	TVKX04****(1)	T/ASV04...	ø3.150 -
0.291 - 0.354	TVKX05****(1)	T/ASV05...	ø3.150 -
0.343 - 0.433	WNGU0603**	T/ASW06...	ø1.969 -
0.417 - 0.520	WNGU07T3**	T/ASW07...	ø1.969 -
0.496 - 0.657	WNGU0904**	T/ASW09...	ø1.969 -
0.594 - 0.732	LMEU1008**	T/ASN10...	ø3.150 -
0.689 - 0.909	LMEU1208**	T/ASN12...	ø3.150 -
0.780 - 1.087	LMEU1509**	T/ASN15...	ø3.150 -

(1) Special inserts may be required depending on the edge width.
(2) Max tool diameter should be confirmed when requesting quotation.

Example of tool designation

T	SW06	R	625	-	062	U	125
①	②	③	④		⑤	⑥	⑦

① Mount specification	
T	Radial drive
A	Axial drive

② Tool shape
Please see table #1

③ Hand of tool	
R	Right
L	Left

④ Tool diameter ø*Dc* (in)	
062	ø6.250"
500	ø5.000"
352	ø3.520"

⑤ Edge width *W* (in)	
062	0.625"
100	1.000"
075	0.750"

⑥ Bore specification	
U	AISI spec (inch)
M	JIS spec (metric)
E	ISO spec (metric)

⑦ Bore diameter ø*d* (in)	
100	ø1.000"
125	ø1.250"
150	ø1.500"

■ Insert

Special corner radius is available.

Available range

Insert Designation	Edge width *W* mm (in)	Corner radius r_ε mm (in)	Grades
SSM...	1.70 - 2.52 (0.067" - 0.099")	0.2 - 1.0 (0.008" - 0.039")	GH130
	2.53 - 3.52 (0.100" - 0.138")	0.2 - 1.5 (0.008" - 0.059")	
	3.53 - 4.52 (0.139" - 0.178")	0.2 - 2.0 (0.008" - 0.079")	
TVKX02,03	-	0 - 1.0 (0.039")	AH725, AH130, AH120
TVKX04,05	-	0 - 2.0 (0.079")	

Insert Designation	Corner radius r_ε mm (in)	Grades
WNGU06	0 - 2.0 (0.079")	AH725, AH130, AH120
WNGU07	0 - 2.4 (0.095")	
WNGU09	0 - 2.8 (0.110")	
LMEU...	0.4 - 4.0 (0.016" - 0.158")	AH725, AH140, AH120

Example of insert designation

WNGU07T3	08	-	xxxxx	AH725
①	②		③	④

① Insert shape
Please see table #1

② Corner radius r_ε (mm)	
08	0.8
16	1.6

③ Identification #
Decided by Tungaloy

④ Grade

Information sheet for quotation & order

When requesting a quotation,
please make a COPY of this page and send to your local tungaloy Sales Engineer.

Company:

Name: **Phone:**

Tool information

Tool diameter: ***øDc***	*øDc* = mm / inch	Sketch of tool:
Edge width: *W*	*W* = mm / inch	
Tool type	• Axial drive • Radial drive • Other	
Bore diameter: ***ød***	*ød* = mm / inch	
Corner radius: ***rε***	*rε* = mm	

Tool Designation:

Insert Designation:

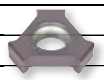
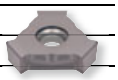
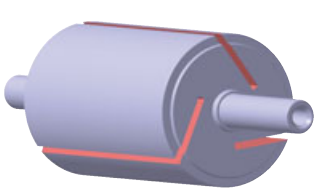
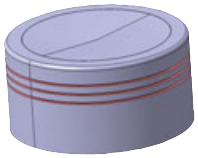
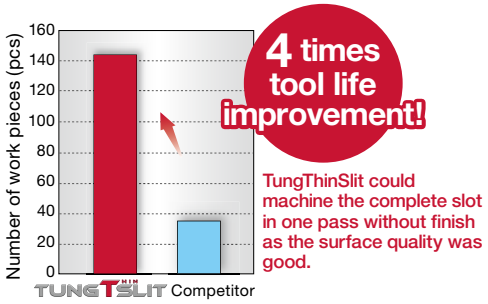
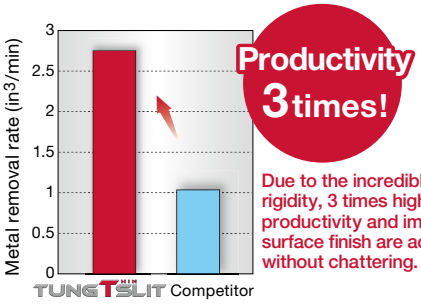
Workpiece information

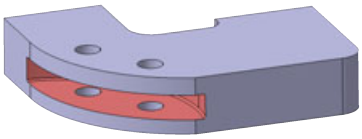
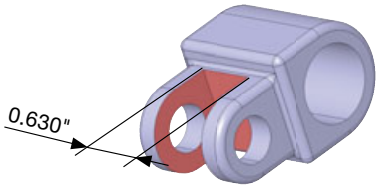
Tolerance of slot width required	mm / inch	Sketch of component:
Slot depth	mm / inch	
Name of component		
Material, hardness		

Machine information

Machine type	• Horizontal • Vertical • Other	Note: e.g. Angled head attachment is used.
Spindle motor power		
Spindle adaptation		

PRACTICAL EXAMPLES

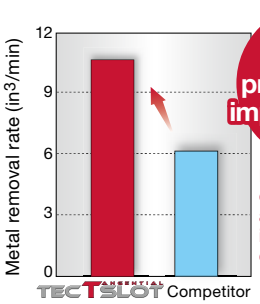
Workpiece type		Rotor	Piston head
Cutter		ASV02N160-E4 (ø3.937" (ø100 mm), 5 cutting edges)	ASV05N400-U031 (ø4", 5 cutting edges)
Insert		TVKX020204-TN MJ 	TVKX050404TN-MJ 
Grade		AH130	AH725
Workpiece material		Alloy steel 	Alloy steel 
Cutting conditions	Cutting speed: Vc (sfm)	530	390
	Chip thickness: t (in)	0.0004	0.005
	Feed per cutting edge: fz (ipt)	0.003	0.006
	Feed speed : Vf (ipm)	7.9	15
	Edge width : W (in)	0.157	0.313
	Depth of slot: ae (in)	1.614	0.75
	Coolant	Air blast	Dry
	Machine	Vertical M/C, CAT50	HSK100
Results		 4 times tool life improvement! TungThinSlit could machine the complete slot in one pass without finish as the surface quality was good.	 Productivity 3 times! Due to the incredible rigidity, 3 times higher productivity and improved surface finish are achieved without chattering.

Workpiece type		Machine parts	Machine parts
Cutter		ASW06N400-U037 (ø4", 5 cutting edges)	TSN10R125M31.7-16-06 (ø4.921", 6 cutting edges)
Insert		WNGU060308TN-MJ 	LMEU100808ZNEN-MJ 
Grade		AH725	AH120
Workpiece material		D2 	65-45-12 
Cutting conditions	Cutting speed: Vc (sfm)	360	500
	Chip thickness: t (in)	0.003	0.006
	Feed per cutting edge: fz (ipt)	0.004	0.008
	Feed speed : Vf (ipm)	7	19
	Edge width : W (in)	0.375	0.630
	Depth of slot: ae (in)	0.906	0.866
	Coolant	Dry	Dry
	Machine	Vertical M/C, CAT40	Vertical M/C, CAT50

Results

	TUNGUSLOT	Competitor
Number of passes	1	2
Chip evacuation	Good	Bad
Chattering	No	With

TungUniversalSlot creates fine surface finish due to the excellent chip evacuation. Metal saw has chattering because of the number of effective edges. TungUniversalSlot machines without any vibration because of the optimum number of edges.



70% productivity improvement!

Higher feed per cutting edge can be applied, as the TecTangentialSlot is tougher than conventional inserts.

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Produced from Recycled paper Nov. 2024 (TJ)