



Multifunctional tool for drilling and turning

TUNGB^{ORE}MINI

Tungaloy Report No. 529-US

Expansion of DMIN = 8 mm (0.315") holder for TinyMini-Turn sleeve







TUNG^{ORE}B^{ORE}MINI

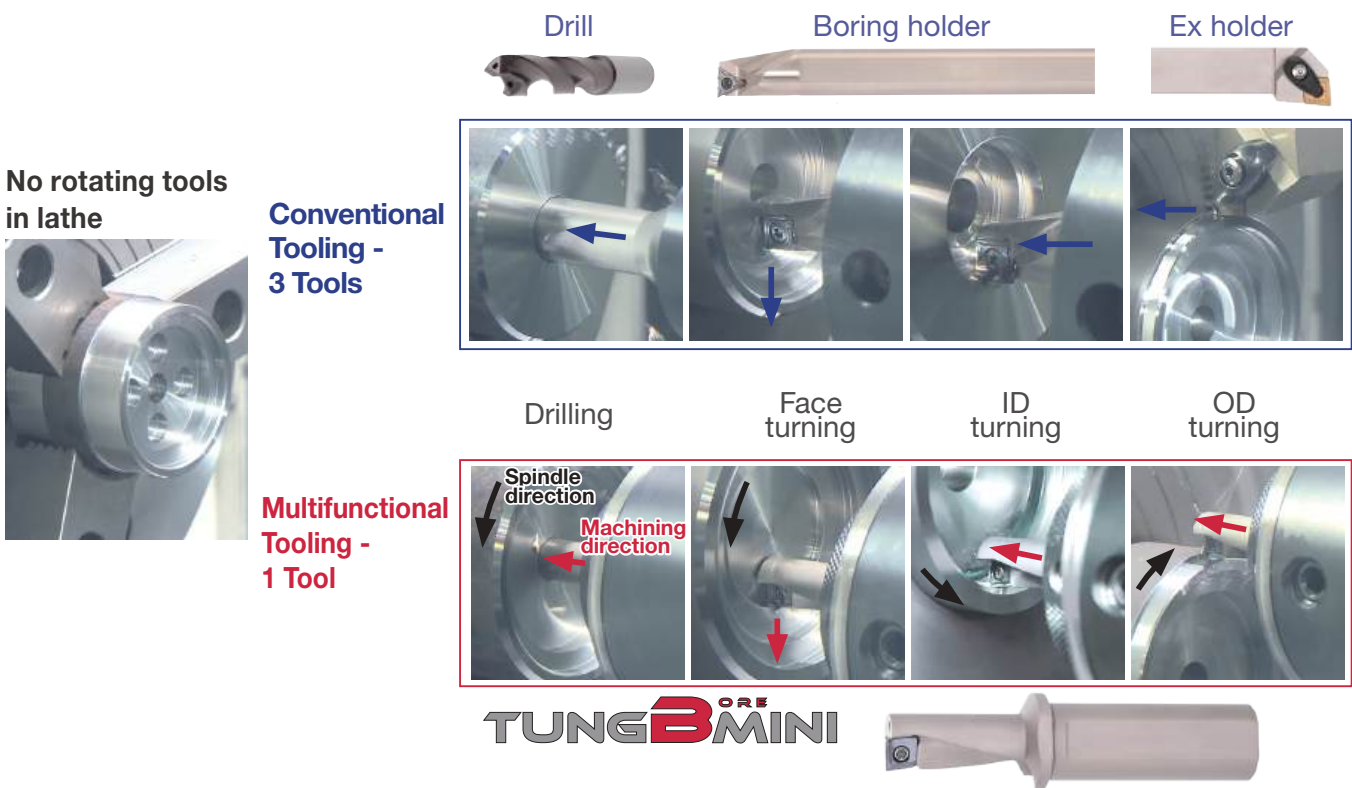


Reduced machine downtime thanks to eliminating
the need for tool changes.
Multifunctional Tool for Drilling and Turning.

Multifunctional tool for improved productivity!

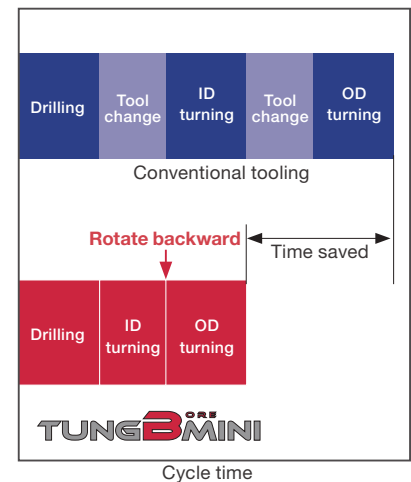
■ Minimum number of tools for maximum productivity

- A single TungBoreMini tool can handle multiple operations such as ID turning after drilling without exchanging the tools
- Allows drilling and hole enlargement on various materials, instead of using a drill and turning tool
- Can be used just like a standard ISO turning tool for ID, OD, and/or face turning applications



■ Reduced machine downtime

Multifunctional TungBoreMini eliminates tool changeover time, resulting in significantly reduced cycle time - this is especially effective in applications where individual processing time is short and quick, resulting in tremendous improvement in cycle time.



Line ups

TBM

Holder for Drilling and Turning
DMIN = 0.315" - 1.260"



New

A-TBM

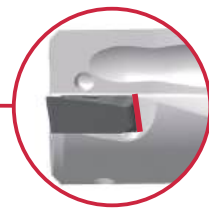
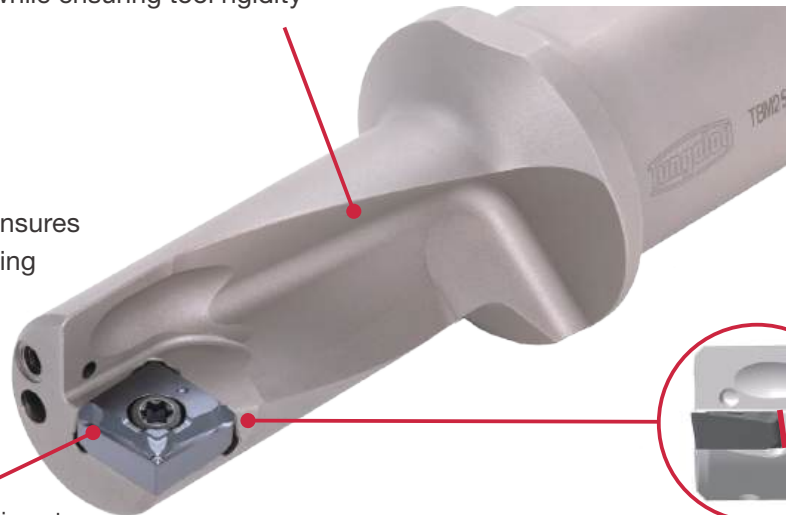
Holder for Drilling and Turning
with TinyMiniTurn sleeves
DMIN = 8 mm



Holder for Drilling and Turning

The flute is designed to promote smooth chip flow,
while ensuring tool rigidity

Optimized through-coolant ensures
effective chip evacuation during
machining



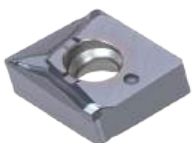
Dovetail interlocking ensures
rigid insert clamping

TBM

Double-sided insert
with 2 corners

XOMU-PS

For toolholders for
DMIN = 0.394" -
1.260"



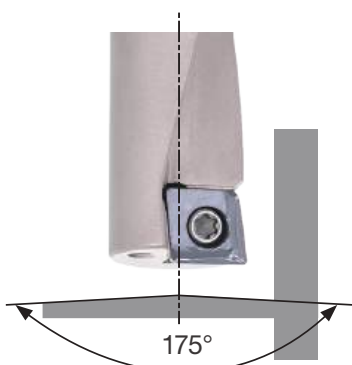
New

A-TBM

Single-sided insert
with 2 corners

XCMT-PS

For toolholders for
DMIN = 8 mm



Creates a near-flat hole bottom

Line ups

Internal boring bars for XOMU inserts

For Internal boring

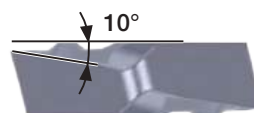
High chip evacuation

Large pocket clearance

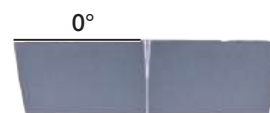


1. Low cutting force

Large inclination angle of XOMU insert



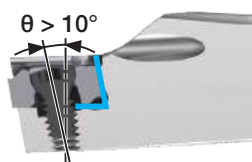
XOMU insert



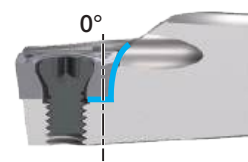
Conventional
(CCMT060204...)

2. High reliability & high rigidity clamping

Dovetail clamping and slanted insert clamping screw



TUNGB^{ORE}MINI



Conventional
(CCMT060204...for boring bar)

GRADES

PVD grade: AH725

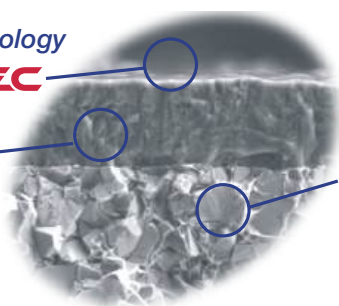
AH725 features a super tough substrate with a new PVD coating layer.

Special surface technology

PREMIUMTEC

Coating layer with
excellent adhesion
strength

PVD coating

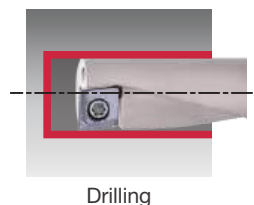


Remarkable toughness
Fine grain carbide

CUTTING PERFORMANCE

Drilling

P	Holder	: TBM25RF318-2.25
	Insert	: XOMU120404-PS AH725
	Workpiece material	: 1045
	Application	: Drilling
	Coolant	: Internal

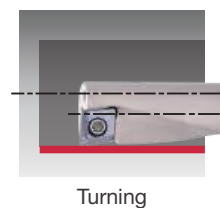


0.002	0.003	0.0035	0.0043	0.0051
Feed: f (ipr)				

Stable machining and excellent chip control during the hole making process.

Internal turning

P	Holder	: TBM25RF318-2.25
	Insert	: XOMU120404-PS AH725
	Workpiece material	: 1045
	Application	: Internal turning
	Coolant	: Internal

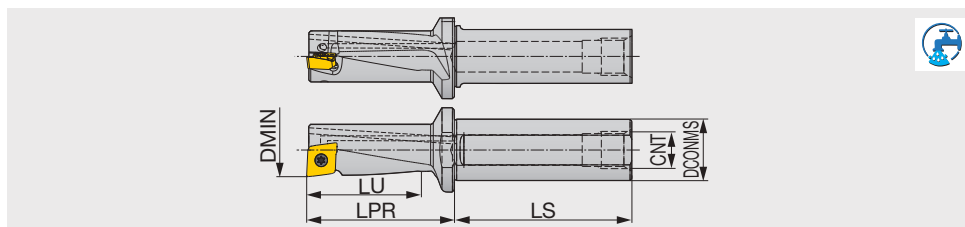


Depth of cut: ap (in)	0.08					
	0.04					
	0.02					
		0.004	0.006	0.008	0.010	0.012
Feed: f (ipr)						

Excellent chip control during I.D. finishing operation.

TBM

Maximum hole depth for L/D = 2.25 mm (0.089")



Inch Designation	DMIN	DCONMS	LU	LS	LPR	CNT	Insert	Torque*
TBM08RF127-2.25	0.315	0.500	0.709	1.634	0.886	-	XCMT040102R-PS	0.52
TBM10R/LF127-2.25	0.394	0.500	0.886	1.600	1.120	5/16-24UNF	XOMU05X204-PS	0.52
TBM12R/LF159-2.25	0.472	0.625	1.063	1.890	1.320	G 1/8	XOMU06H204-PS	0.74
TBM14R/LF159-2.25	0.551	0.625	1.240	1.890	1.519	G 1/8	XOMU07H304-PS	0.96
TBM16R/LF19-2.25	0.630	0.750	1.417	2.000	1.689	G 1/8	XOMU08T304-PS	1.70
TBM18RF254-2.25	0.709	1.000	1.594	2.280	2.124	G 1/8	XOMU09T304-PS	1.70
TBM20RF254-2.25	0.787	1.000	1.772	2.280	2.163	G 1/8	XOMU100404-PS	2.58
TBM25RF318-2.25	0.984	1.250	2.224	2.280	2.717	G 1/8	XOMU120404-PS	2.58
TBM32RF381-2.25	1.260	1.500	2.835	2.688	3.463	G 1/8	XOMU160508-PS	2.58

Torque*: Recommended clamping torque (lb-ft)

(Unit: Inch)

Metric Designation	DMIN	DCONMS	LU	LS	LPR	CNT	Insert	Torque*
TBM08RF12-2.25	8	12	18	41.5	22.5	-	XCMT040102R-PS	0.7
TBM10R/LF12-2.25	10	12	22.5	41.5	28.45	UNF 5/16-24	XOMU05X204-PS	0.7
TBM12R/LF16-2.25	12	16	27	43.9	33.53	G 1/8	XOMU06H204-PS	1
TBM14R/LF16-2.25	14	16	31.5	46.4	38.57	G 1/8	XOMU07H304-PS	1.3
TBM16R/LF20-2.25	16	20	36	57.1	42.9	G 1/8	XOMU08T304-PS	2.3
TBM18RF25-2.25	18	25	40.5	54	53.96	G 1/8	XOMU09T304-PS	2.3
TBM20RF25-2.25	20	25	45	54	54.94	G 1/8	XOMU100404-PS	3.5
TBM25RF32-2.25	25	32	56.5	59	69	G 1/8	XOMU120404-PS	3.5
TBM32RF40-2.25	32	40	72	69	87.95	G 1/8	XOMU160508-PS	3.5

Torque*: Recommended clamping torque (N-m)

(Unit: mm)

SPARE PARTS

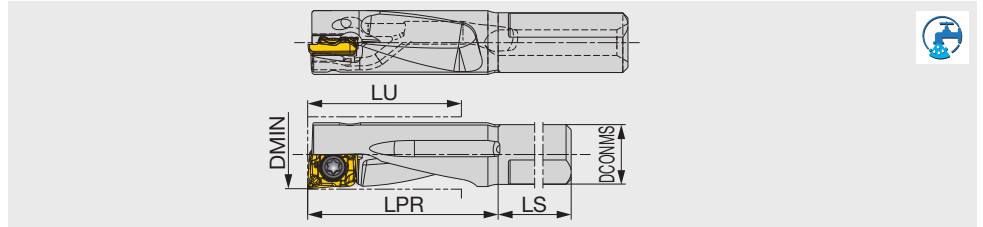


Designation	Clamping screw	Wrench
TBM08R...	CSTD-1.8	T-6D
TBM10R...	CSTB-2L040	T-6D
TBM12R...	CSPB-2.2	IP-7D
TBM14R...	CSPB-2.5	IP-8D
TBM16R..., TBM18RF...	CSTB-3	T-9D
TBM20RF...	CSPB-3.5	IP-15D
TBM25RF...	CSTB-4	T-15D
TBM32RF...	CSTB-4.5L110P	T-15D

New

A-TBM

Maximum hole depth for L/D = 2.25 mm (0.089")



Metric Designation	DMIN	DCONMS	LU	LS	LPR	CNT	Insert	Torque*
A07080-TBMRF-2.25	8	7	18	15	22.5	-	XCMT040102R-PS	0.7

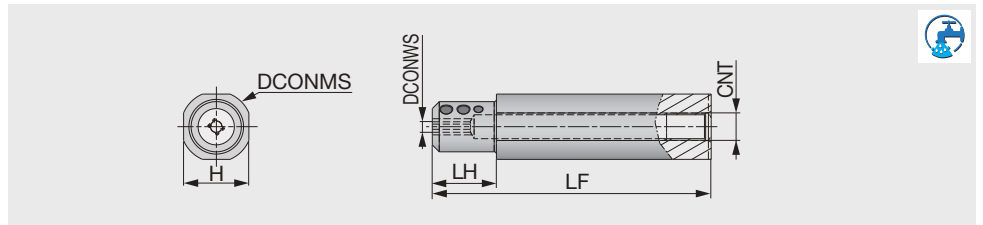
Torque*: Recommended clamping torque (N-m) (Unit: mm)

SPARE PARTS

Designation	Clamping screw	Wrench
A07080-TBMR..	CSTD-1.8	T-6D

JBBS-4N

Sleeve for internal coolant supply with 4 coolant holes



Metric Designation	DCONMS	DCONWS	LF	LH	H	CNT
JBBS159-7-L100C-4N	15.875	7	100	10	14.58	Rc1/8
JBBS16-7-L100C-4N	16	7	100	10	15	Rc1/8
JBBS19-7-L100C-4N	19.05	7	100	20	17.2	Rc1/8
JBBS20-7-L100C-4N	20	7	100	20	18	Rc1/8
JBBS22-7-L100C-4N	22	7	100	20	20	Rc1/8
JBBS25-7-L100C-4N	25	7	100	23	23	Rc1/8
JBBS254-7-L100C-4N	25.4	7	100	23	23.4	Rc1/8

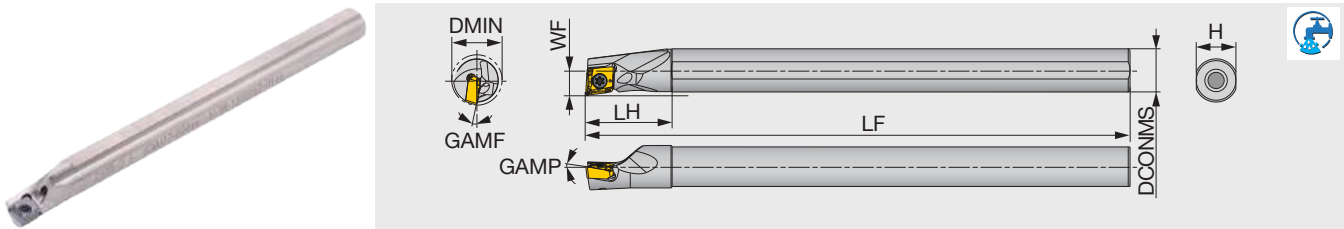
(Unit: mm)

SPARE PARTS

Designation	Clamping screw	Wrench
JBBS**-7-L**C-4N	SSHM5-4PF-S	P-2.5

A/E-SXUOR/L

Screw-on boring bar, for XOMU rhombic inserts



Metric Designation	DMIN	DCONMS	WF	LF	LH	H	GAMP	GAMF	Insert
A08H-SXUOR/L05-D100	10	8	5	100	16	7.5	-7°	-0.8°	XOMU05X204-PS
A12M-SXUOR/L07-D140	14	12	7	150	24	11	-7.2°	3.2°	XOMU07H304-PS
E08K-SXUOR/L05-D100	10	8	5	125	22	7.5	-7°	-0.8°	XOMU05X204-PS
E12Q-SXUOR/L07-D140	14	12	7	180	27	11	-7.2°	3.2°	XOMU07H304-PS

(Unit: mm)

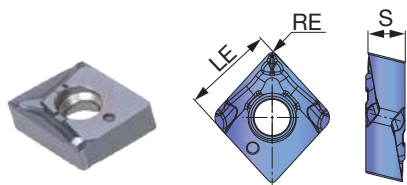
SPARE PARTS



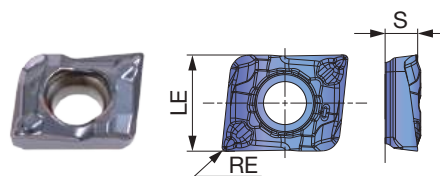
Designation	Clamping screw	Wrench
A08H-SXUOR/L05-D100	CSTB-2L040	T-6F
A12M-SXUOR/L07-D140	CSPB-2.5	IP-8D
E08K-SXUOR/L05-D100	CSTB-2L040	T-6F
E12Q-SXUOR/L07-D140	CSPB-2.5	IP-8D

■ INSERT

XOMU-PS



XCMT-PS



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

★ : First choice

[illegible]

● : Line up
(Unit: Inch)

STANDARD CUTTING CONDITIONS

Drilling

ISO	Workpiece materials	Cutting speed Vc (sfm)	Minimum bore diameter: DMIN							
			ø0.394" (ø10 mm)	ø0.472" (ø12 mm)	ø0.551" (ø14 mm)	ø0.630" (ø16 mm)	ø0.709" (ø18 mm)	ø0.787" (ø20 mm)	ø0.984" (ø25 mm)	ø1.260" (ø32 mm)
			Depth of cut: ap (in)							
P	Low carbon steel Carbon steel	164 - 591	0.0008 - 0.0020	0.0008 - 0.0028	0.0004 - 0.0030	0.0004 - 0.0031	0.0020 - 0.0051	0.0020 - 0.0051	0.0020 - 0.0055	0.0020 - 0.0055
M	Stainless steel	164 - 525	0.0008 - 0.0020	0.0008 - 0.0028	0.0004 - 0.0030	0.0004 - 0.0031	0.0020 - 0.0051	0.0020 - 0.0051	0.0020 - 0.0055	0.0020 - 0.0055
K	Cast iron	164 - 591	0.0008 - 0.0020	0.0008 - 0.0028	0.0004 - 0.0030	0.0004 - 0.0031	0.0020 - 0.0051	0.0020 - 0.0051	0.0020 - 0.0055	0.0020 - 0.0055
N	Aluminum alloys	328 - 984	0.0008 - 0.0020	0.0008 - 0.0028	0.0004 - 0.0030	0.0004 - 0.0031	0.0020 - 0.0051	0.0020 - 0.0051	0.0020 - 0.0055	0.0020 - 0.0055

(Unit: Inch)

Internal turning

ISO	Workpiece materials	Cutting speed Vc (sfm)	Minimum bore diameter: DMIN							
			ø0.394" (ø10 mm)	ø0.472" (ø12 mm)	ø0.551" (ø14 mm)	ø0.630" (ø16 mm)	ø0.709" (ø18 mm)	ø0.787" (ø20 mm)	ø0.984" (ø25 mm)	ø1.260" (ø32 mm)
			Depth of cut: ap (in)							
P	Low carbon steel Carbon steel	164 - 591	0.0197 - 0.1181	0.0197 - 0.1378	0.0197 - 0.1772	0.0197 - 0.1969	0.0197 - 0.2165	0.0197 - 0.2362	0.0197 - 0.2559	0.0197 - 0.2756
			Feed: f (ipr)							
			0.0020 - 0.0079	0.0020 - 0.0079	0.0020 - 0.0079	0.0020 - 0.0079	0.0039 - 0.0118	0.0039 - 0.0118	0.0039 - 0.0118	0.0039 - 0.0157

(Unit: Inch)

ISO	Workpiece materials	Cutting speed Vc (sfm)	Minimum bore diameter: DMIN							
			ø0.394" (ø10 mm)	ø0.472" (ø12 mm)	ø0.551" (ø14 mm)	ø0.630" (ø16 mm)	ø0.709" (ø18 mm)	ø0.787" (ø20 mm)	ø0.984" (ø25 mm)	ø1.260" (ø32 mm)
			Depth of cut: ap (in)							
M	Stainless steel	164 - 525	0.0197 - 0.1181	0.0197 - 0.1378	0.0197 - 0.1772	0.0197 - 0.1969	0.0197 - 0.2165	0.0197 - 0.2362	0.0197 - 0.2559	0.0197 - 0.2756
			Feed: f (ipr)							
			0.0020 - 0.0079	0.0020 - 0.0079	0.0020 - 0.0079	0.0020 - 0.0079	0.0039 - 0.0118	0.0039 - 0.0118	0.0039 - 0.0118	0.0039 - 0.0157

(Unit: Inch)

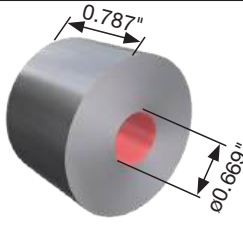
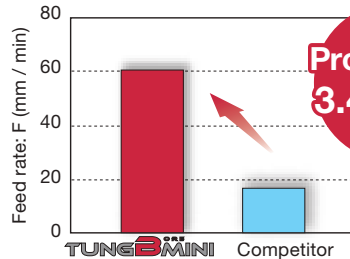
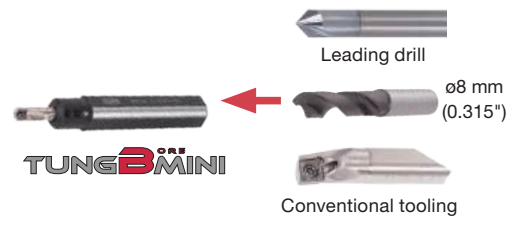
ISO	Workpiece materials	Cutting speed Vc (sfm)	Minimum bore diameter: DMIN							
			ø0.394" (ø10 mm)	ø0.472" (ø12 mm)	ø0.551" (ø14 mm)	ø0.630" (ø16 mm)	ø0.709" (ø18 mm)	ø0.787" (ø20 mm)	ø0.984" (ø25 mm)	ø1.260" (ø32 mm)
			Depth of cut: ap (in)							
K	Cast iron	164 - 591	0.0197 - 0.1181	0.0197 - 0.1378	0.0197 - 0.1772	0.0197 - 0.1969	0.0197 - 0.2165	0.0197 - 0.2362	0.0197 - 0.2559	0.0197 - 0.2756
			Feed: f (ipr)							
			0.0020 - 0.0079	0.0020 - 0.0079	0.0020 - 0.0079	0.0020 - 0.0079	0.0039 - 0.0118	0.0039 - 0.0118	0.0039 - 0.0118	0.0039 - 0.0157

(Unit: Inch)

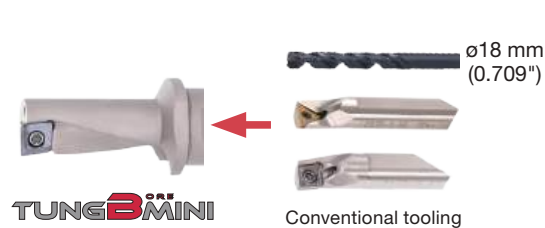
ISO	Workpiece materials	Cutting speed Vc (sfm)	Minimum bore diameter: DMIN							
			ø0.394" (ø10 mm)	ø0.472" (ø12 mm)	ø0.551" (ø14 mm)	ø0.630" (ø16 mm)	ø0.709" (ø18 mm)	ø0.787" (ø20 mm)	ø0.984" (ø25 mm)	ø1.260" (ø32 mm)
			Depth of cut: ap (in)							
N	Aluminum alloys	328 - 984	0.0197 - 0.1181	0.0197 - 0.1378	0.0197 - 0.1772	0.0197 - 0.1969	0.0197 - 0.2165	0.0197 - 0.2362	0.0197 - 0.2559	0.0197 - 0.2756
			Feed: f (ipr)							
			0.0020 - 0.0079	0.0020 - 0.0079	0.0020 - 0.0079	0.0020 - 0.0079	0.0039 - 0.0118	0.0039 - 0.0118	0.0039 - 0.0118	0.0039 - 0.0157

(Unit: Inch)

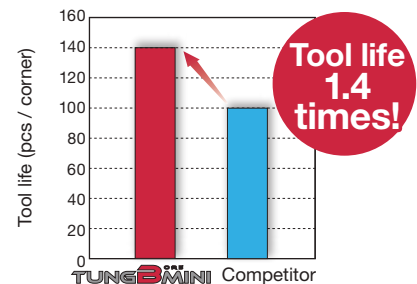
PRACTICAL EXAMPLES

Workpiece type		Machine parts	Machine parts
Toolholder		TBM12RF159-2.25	A07080-TBMRF-2.25
Insert		XOMU06H204-PS	XCMT040102R-PS
Grade		AH725	AH725
Workpiece material		440C	1045
			
Cutting conditions	Cutting speed: V_c (sfm)	263	Drilling: 164, Internal turning: 394
	Feed : f (ipr)	0.006	Drilling: 0.001, Internal turning: 0.002
	Depth of cut : a_p (in)	0.098	0.020 - 0.079
	Coolant	Wet	Wet
Results		 Productivity 3.4 times! TungBoreMini has improved feed rate by 3.4 times for drilling and 1.7 times for ID turning over the competitor's multifunction tool. Tool life has been improved by as much as 1.2 times.	 TungBoreMini can reduce the number of tools from 3 to 1.
Workpiece type		Knob part	Bearing part
Toolholder		TBM18RF254-2.25	TBM25RF318-2.25
Insert		XOMU09T304-PS	XOMU120404-PS
Grade		AH725	AH725
Workpiece material		1045	60-40-18
			
Cutting conditions	Cutting speed: V_c (sfm)	Drilling: 230, Internal turning: 230	Internal turning: 197, Face turning: 328
	Feed : f (ipr)	Drilling: 0.004, Internal turning: 0.010	Internal turning: 0.008, Face turning: 0.006
	Depth of cut : a_p (in)	0.020 - 0.040	0.020 - 0.079
	Coolant	Wet	Wet

Results



A single **TungBoreMini** performed three different operations, allowing significant productivity improvement.



TungBoreMini provided 1.4x tool life increase over the competitor tool.

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