

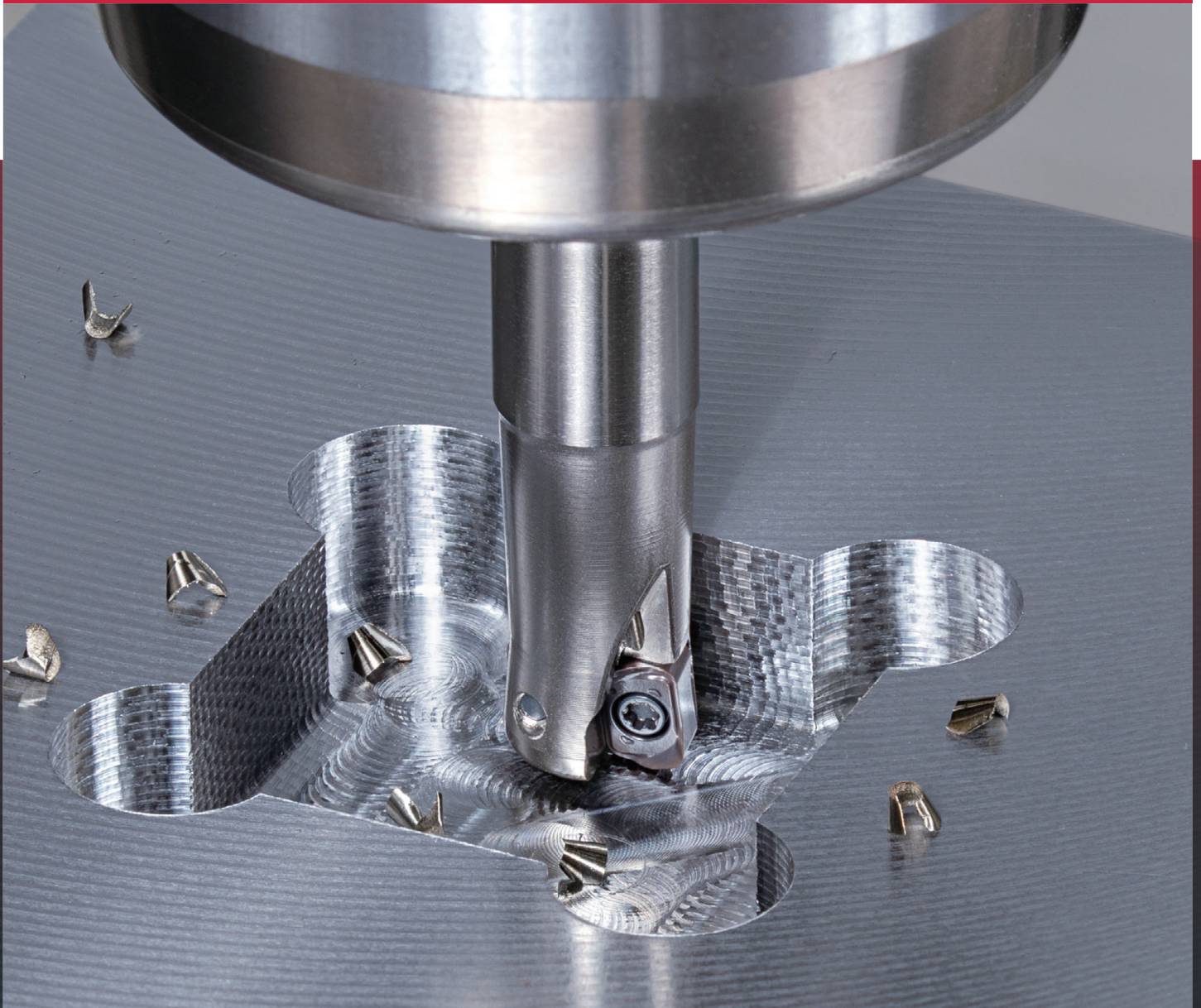
High feed milling

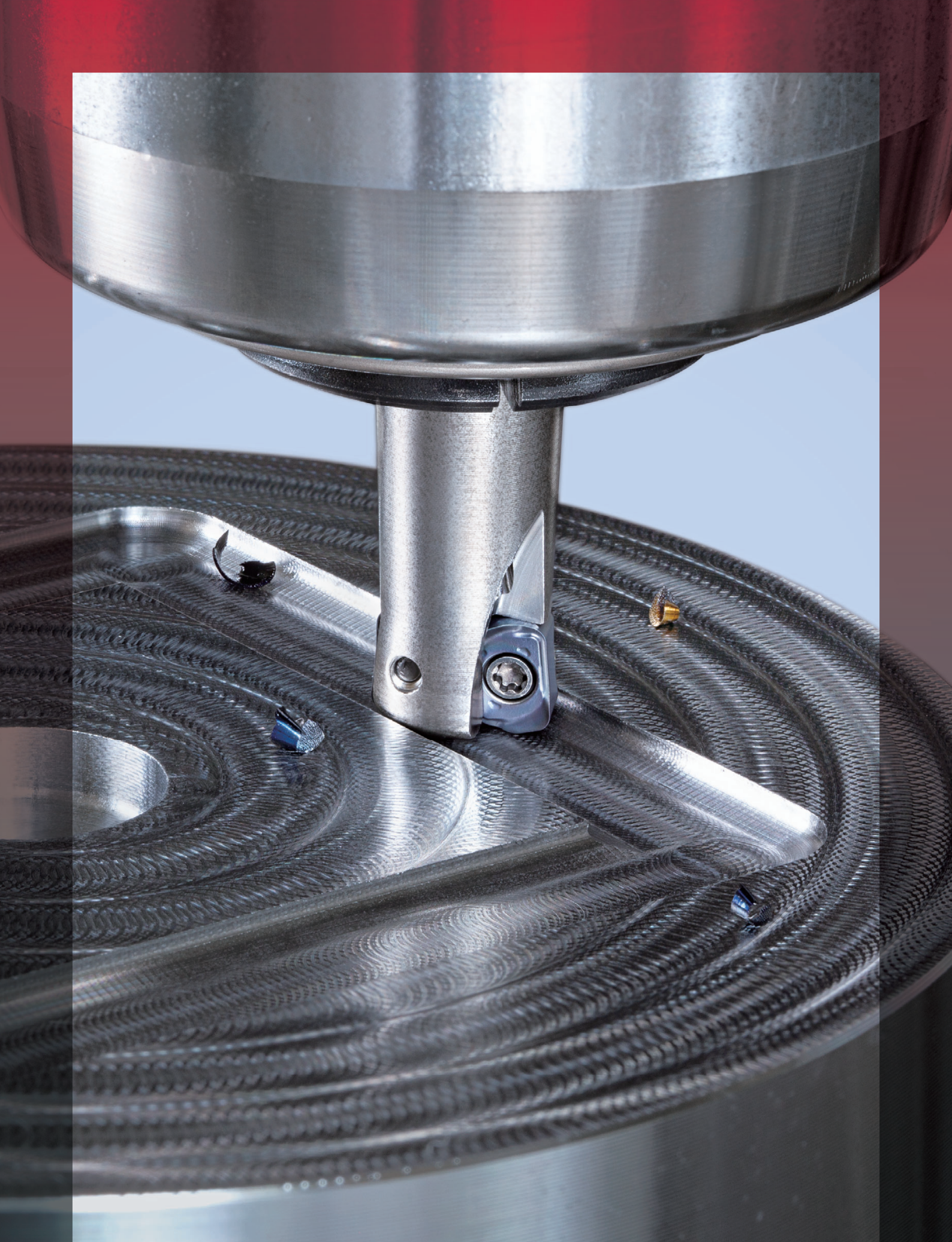
ADD^oFEED

Tungaloy Report No. 545-US

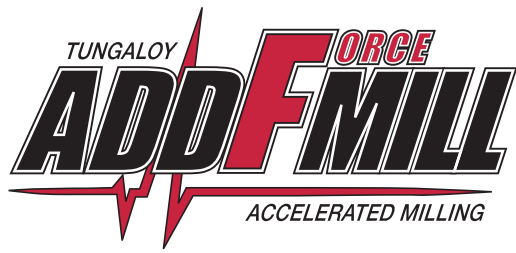
Small diameter high feed milling solution

A great cost saving alternative for solid carbide end mills





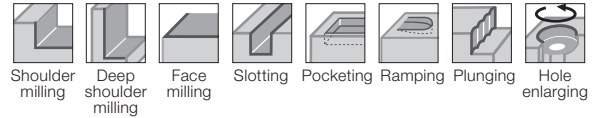
INDUSTRY 4.0
FEED the SPEED!



ADD D FEED



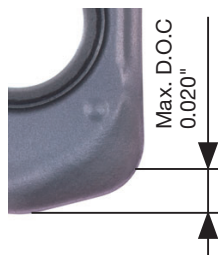
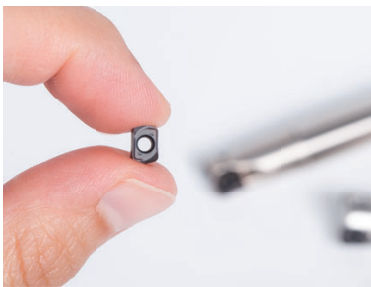
Small, robust double-sided 4 cutting edged insert for
high feed milling



Small inserts, close pitch design

Small insert design allows higher machining efficiency and reduced tool costs due to increased number of inserts

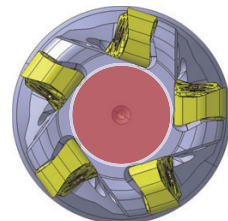
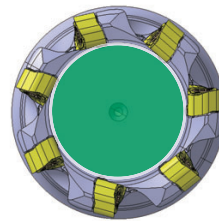
AddDoFeed 02 inserts for cutter diameters $\varnothing 0.375 - 1.000$ inch



Small inserts enable close pitch and rigid design

ADD^oFEED

Competitor



Large web thickness

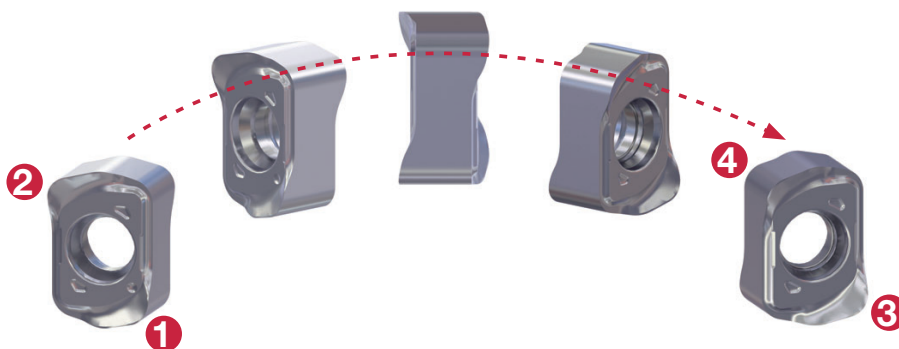
Conventional web thickness

Number of inserts per diameter comparison

Tool dia. DCX (inch)	No. of inserts (z)		
	ADD^oFEED	DOFEED 03	Competitor
$\varnothing 0.375$	1	-	-
$\varnothing 0.500$	2	-	-
$\varnothing 0.625$	4	2	2
$\varnothing 0.750$	5	4	3
$\varnothing 1.000$	7	5	4

Economical 4-cutting edged insert

Double-sided, 4-cutting edged insert - an unprecedented insert design for cutters in the small diameter range

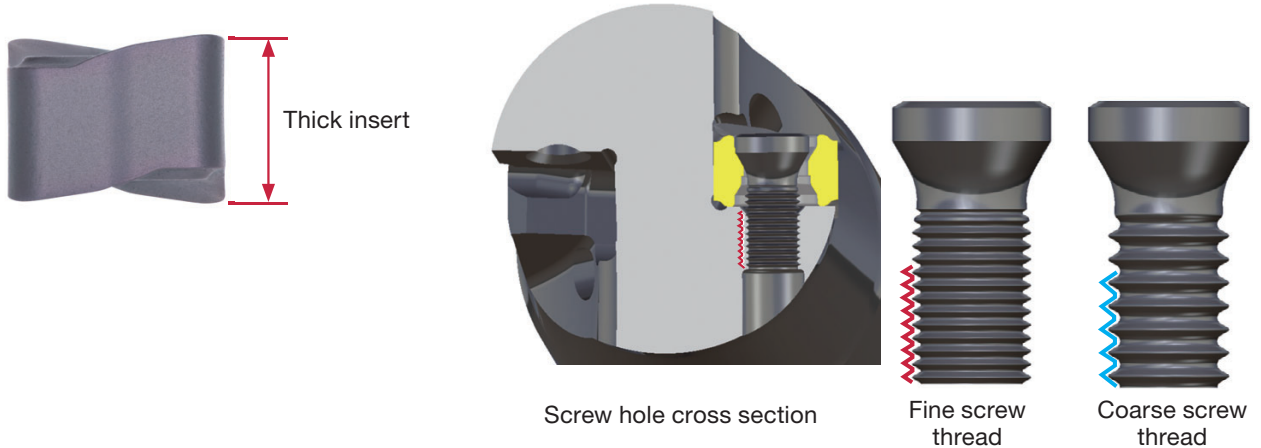


High tool rigidity

High tool rigidity is achieved by using higher material support below each pocket and fine thread screws, allowing this small-sized cutter to successfully withstand higher cutting force

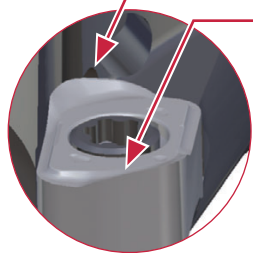
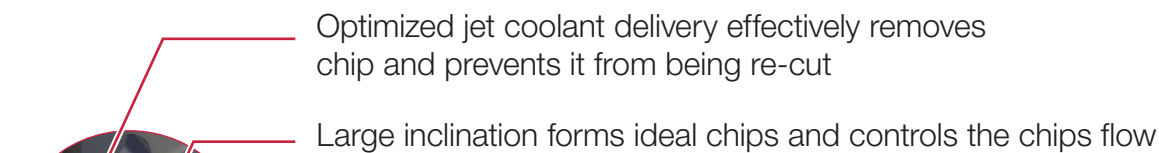
The robust design of AddDoFeed 02 insert provides excellent fracture resistance

Shallow-pitched fine threads prevent screw from self-loosening due to higher number of threads in contact

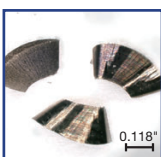


Effective chip evacuation

Chip jamming and re-cutting are challenges when machining narrow grooves and small cavities. AddDoFeed insert features an inclination on the cutting edge optimized for effective chip formation, which eliminates chip re-cutting and prolongs insert tool life



ADD D FEED
Good
 Curl consistently
 at ideal shape






Competitor
Poor
 Crushed or
 unstable

P	Cutter	: EXN02R050U0050-02 (ø0.500", z = 2)
	Insert	: LNMU0202ZWR-MM AH3225
	Workpiece material	: Carbon steels (1055)
	Cutting speed	: Vc = 656 sfm
	Feed per tooth	: fz = 0.039 ipt
	Depth of cut	: ap = 0.020"
	Coolant	: Dry
	Machine	: Vertical M/C, CAT30

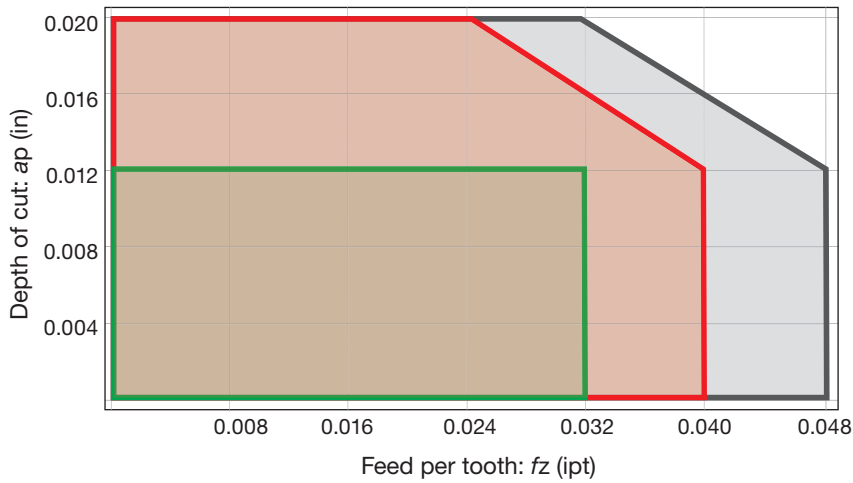
Three cutter body styles

Short, long-neck shank, and modular head are available for various applications

Short shank	Long-neck shank	Modular head
 <p>Rigid tool body for high efficiency machining</p>	 <p>For long reach applications</p>	 <p>Couple with tapered shank or carbide shank for increased rigidity</p>

APPLICATION

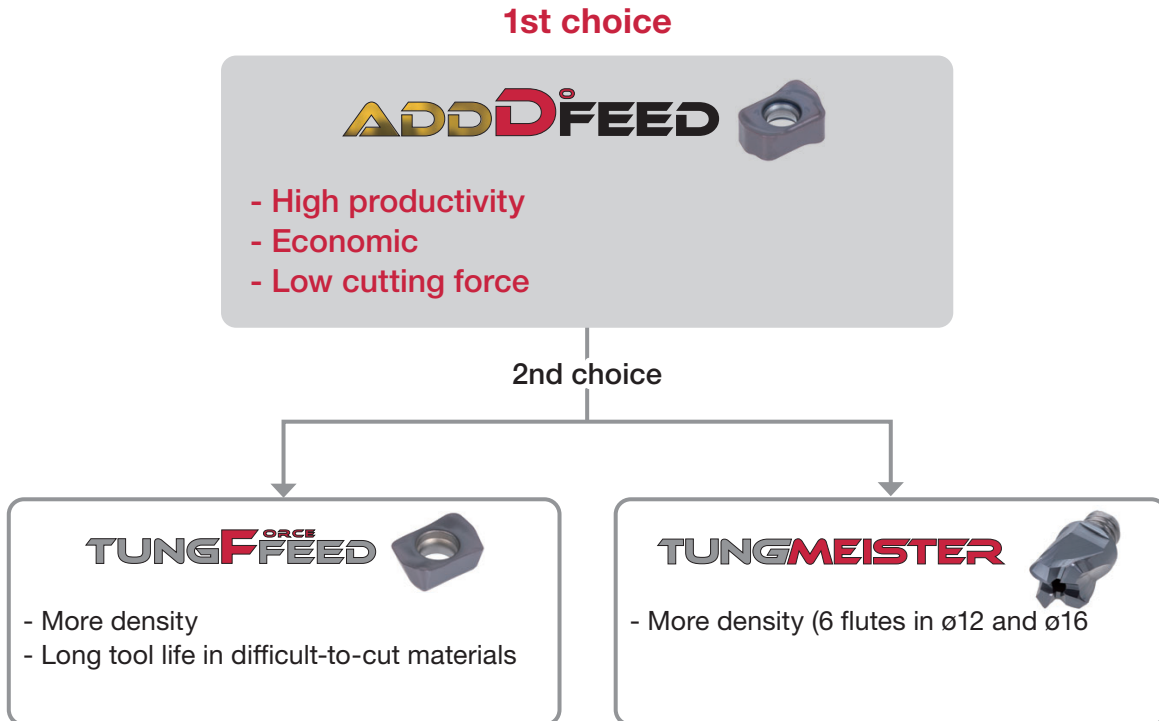
P



- For short shanks in $\leq 3xD$
- For long-neck shanks in $\geq 4xD$
- For modular head in $\geq 7xD$

■ Tool selection guide

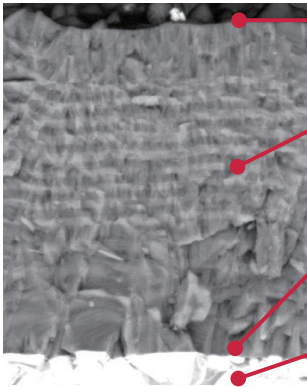
AddDoFeed is the most powerful tool option in diameter range $\varnothing 0.375 - 1.000$ inch at $a_p \leq 0.020$ inch



I Grades with long tool life for a wide range of materials

AH3225 **P M K**

- Nano multi-layer coating technology with three major properties for optimal cutting edge integrity
- Increased resistance to wear, fracture, oxidation, built-up edge, and delamination



Resistance to built-up edge

The coating surface prevents built-up edge

Resistance to wear, oxidation, and fracture

Multi-layered coating is designed to resist wear and oxidation, while preventing micro-cracks from propagating in the coating layer for improved resistance to edge chipping

Strong coating/substrate adhesion

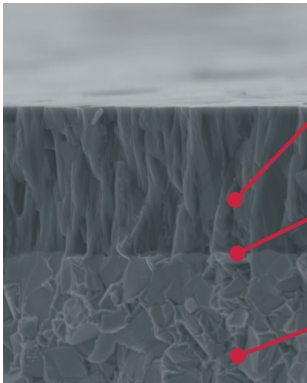
Coating is optimized for strong adhesion property with substrate to maintain strong cutting edge integrity

Carbide substrate

High resistance to fracture

AH130 **M S**

- Tough grade with high chipping and welding resistance
- Ideal for machining stainless steel and titanium alloys



Flash-coat (Ti,Al)N based PVD coated grade

Excellent anti-welding and -oxidation properties
Super wear resistance

Excellent adhesion strength

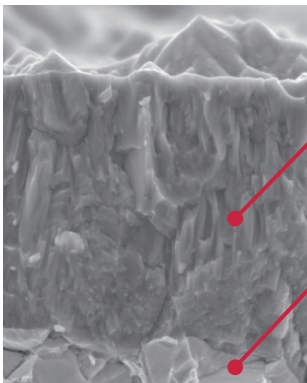
Prevents coated layer from peeling off
Stable tool life

Unique substrate

Excellent balance of hardness and toughness
Wear resistance with anti-chipping properties

AH8015 **P K S H**

- Incorporates a hard coating layer and carbide substrate
- Strong resistance to wear, heat, and built-up edge, ideal for machining hard or difficult materials



Extremely hard layer of nano multi-layered AlTiN coating with high Al content

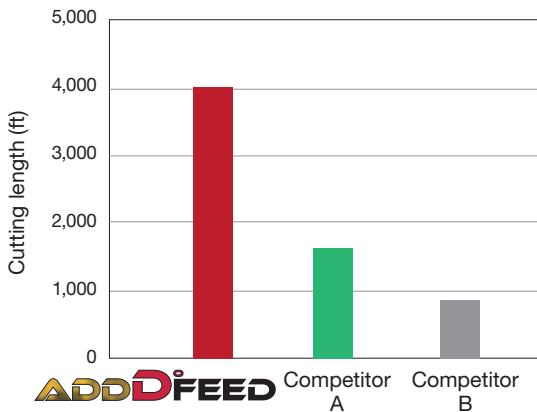
Increases hardness by 20 %
Prevents micro cracks from developing

Carbide substrate

High resistance to wear

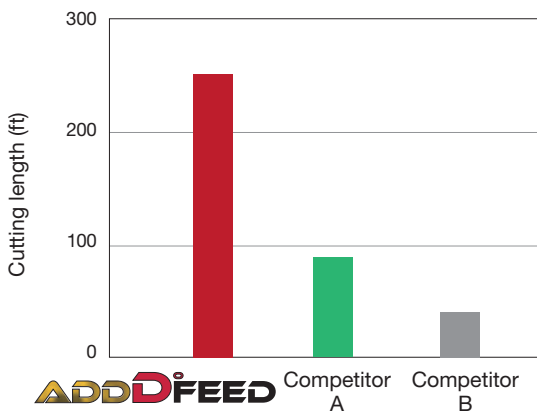
CUTTING PERFORMANCE

P 1055 (190HB)



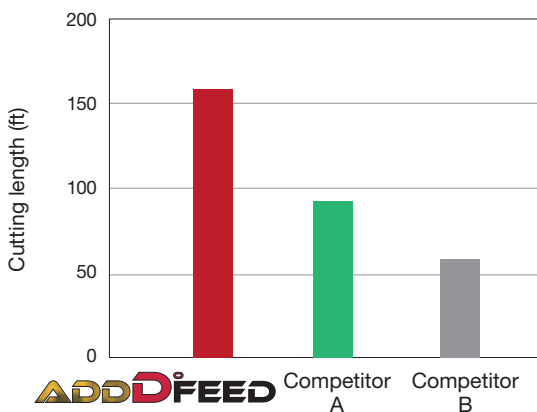
Cutter : EXN02R050U0050-02 ($\phi 0.500''$, $z = 2$)
 Insert : LNMU0202ZER-MM AH3225
 Tool overhang : 1.181"
 Cutting speed : $V_c = 820$ sfm
 Feed per tooth : $f_z = 0.024$ ipt
 Depth of cut : $a_p = 0.016''$
 Width of cut : $a_e = 0.386''$
 Coolant : Dry
 Machine : Vertical M/C, CAT40

M 304SS (190HB)



Cutter : EXN02R050U0050-02 ($\phi 0.500''$, $z = 2$)
 Insert : LNMU0202ZER-MM AH130
 Tool overhang : 1.181"
 Cutting speed : $V_c = 591$ sfm
 Feed per tooth : $f_z = 0.012$ ipt
 Depth of cut : $a_p = 0.012''$
 Width of cut : $a_e = 0.386''$
 Coolant : Wet
 Machine : Vertical M/C, CAT40

H H13 (52HRC)

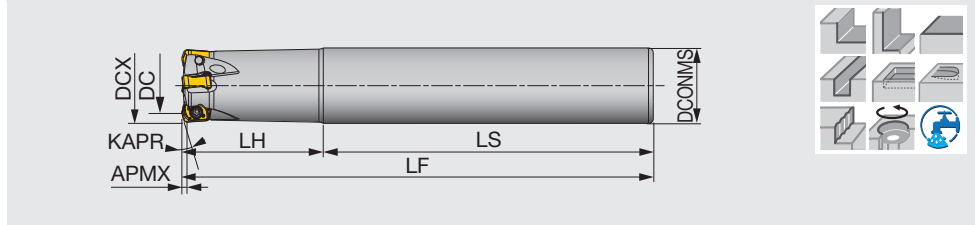


Cutter : EXN02R050U0050-02 ($\phi 0.500''$, $z = 2$)
 Insert : LNMU0202ZER-MM AH8015
 Tool overhang : 1.181"
 Cutting speed : $V_c = 394$ sfm
 Feed per tooth : $f_z = 0.020$ ipt
 Depth of cut : $a_p = 0.012''$
 Width of cut : $a_e = 0.386''$
 Coolant : Dry
 Machine : Vertical M/C, CAT40

EXN02

High feed endmill, shank type, for 4-corner double sided inserts

GAMP = +6°, GAMF = +5° ~ +11°



Inch	APMX	DCX	CICT	DC	DCONMS	LF	LH	LS	KAPR	WT (lb)	Air hole	Insert
EXN02R037U0037-01	0.020	0.375	1	0.212	0.375	3.000	0.750	2.250	17°	0.090	With	LNMU02...
EXN02R037U0037-01L	0.020	0.375	1	0.212	0.375	3.500	1.250	2.250	17°	0.090	With	LNMU02...
EXN02R050U0050-02	0.020	0.500	2	0.335	0.500	3.000	0.750	2.250	17°	0.150	With	LNMU02...
EXN02R050U0050-02L	0.020	0.500	2	0.335	0.500	4.250	2.000	2.250	17°	0.200	With	LNMU02...
EXN02R062U0062-03L	0.020	0.625	3	0.460	0.625	4.500	2.000	2.500	17°	0.330	With	LNMU02...
EXN02R062U0062-04	0.020	0.625	4	0.460	0.625	4.000	1.500	2.500	17°	0.310	With	LNMU02...
EXN02R075U0075-04L	0.020	0.750	4	0.585	0.750	6.500	3.500	3.000	17°	0.640	With	LNMU02...
EXN02R075U0075-05	0.020	0.750	5	0.585	0.750	5.000	2.000	3.000	17°	0.510	With	LNMU02...
EXN02R100U0100-06L	0.020	1.000	6	0.835	1.000	7.000	4.000	3.000	17°	1.280	With	LNMU02...
EXN02R100U0100-07	0.020	1.000	7	0.835	1.000	5.500	2.500	3.000	17°	1.040	With	LNMU02...

SPARE PARTS



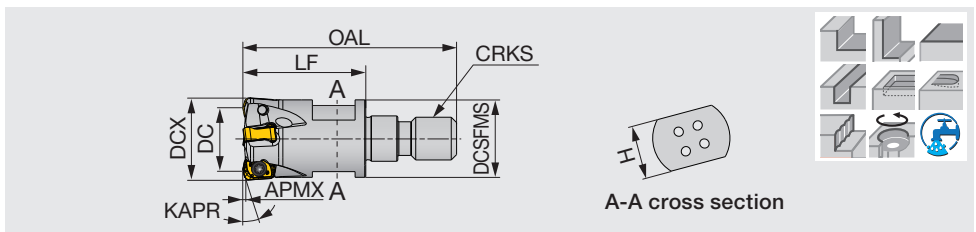
Designation	Clamping screw	Wrench
EXN02...	CSPB-1.8FL4.3	IP-6DB

TUNGFLEX

HXN02

High feed endmill, modular type (TungFlex)

GAMP = +6°, GAMF = +5° ~ +11°



Metric	APMX	DCX	CICT	DC	DCSFMS	OAL	LF	H	KAPR	CRKS	WT (kg)	Air hole	Insert
HXN02R008MM06-01	0.5	8	1	3.95	9.5	33.5	19	7	17°	M6	0.01	With	LNMU02...
HXN02R010MM06-02	0.5	10	2	5.85	9.5	31.5	17	7	17°	M6	0.01	With	LNMU02...
HXN02R012MM06-02	0.5	12	2	7.8	10	31.5	17	7	17°	M6	0.01	With	LNMU02...
HXN02R016MM08-04	0.5	16	4	11.8	14.5	40	23	10	17°	M8	0.03	With	LNMU02...
HXN02R020MM10-05	0.5	20	5	15.8	17.8	49	30	15	17°	M10	0.06	With	LNMU02...
HXN02R025MM12-07	0.5	25	7	20.8	23	52	30	17	17°	M12	0.1	With	LNMU02...

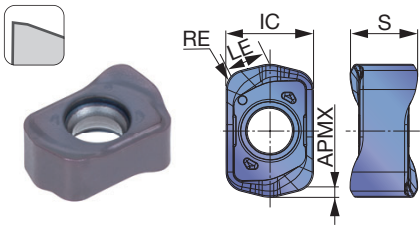
SPARE PARTS



Designation	Clamping screw	Wrench
HXN02R008...	CSPB-1.8FL3.6	IP-6DB
HXN02R010...	CSPB-1.8FL4.3	IP-6DB
HXN02R012...	CSPB-1.8FL4.3	IP-6DB
HXN02R016...	CSPB-1.8FL4.3	IP-6DB
HXN02R020...	CSPB-1.8FL4.3	IP-6DB
HXN02R025...	CSPB-1.8FL4.3	IP-6DB

INSERT

LNMU02-MM (for general purpose)



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

★ : First choice
☆ : Second choice

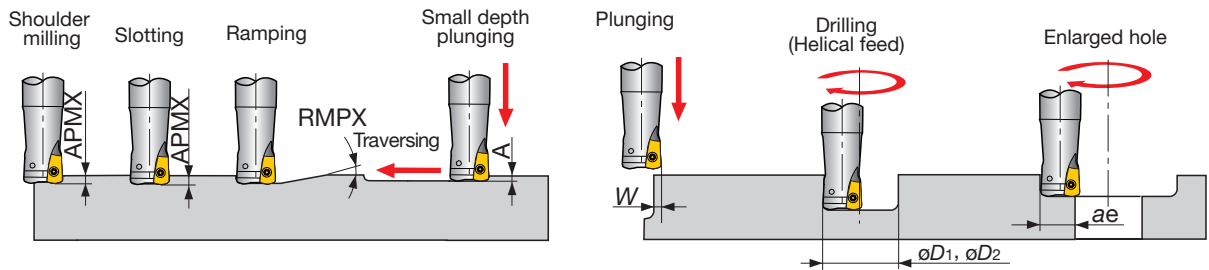
Designation	RE	APMX	Coated							LE	IC	S	
			AH130	AH3225	AH8015								
LNMU0202ZER-MM	0.035	0.020	●	●	●						0.070	0.157	0.122

●: Line up

STANDARD CUTTING CONDITIONS

ISO	Workpiece materials	Hardness	Priority	Grades	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)	
P	Carbon steels 1045, 1055, etc.	- 300HB	First choice	AH3225	330 - 980	0.008 - 0.047	
		- 300HB	For wear resistance	AH8015	330 - 980	0.008 - 0.047	
	Alloy steels 4140, etc.	- 300HB	First choice	AH3225	330 - 980	0.008 - 0.047	
		- 300HB	For wear resistance	AH8015	330 - 980	0.008 - 0.047	
	Prehardened steels NAK80, PX5, etc.	30 - 40HRC	First choice	AH8015	330 - 660	0.008 - 0.031	
		30 - 40HRC	For impact resistance	AH3225	330 - 660	0.008 - 0.031	
M	Stainless steels 304SS, etc.	- 200HB	First choice	AH130	330 - 490	0.008 - 0.031	
K	Gray cast irons class25, etc.	150 - 250HB	First choice	AH8015	330 - 980	0.008 - 0.047	
		150 - 250HB	For impact resistance	AH3225	330 - 980	0.008 - 0.047	
	Ductile cast irons 80-50-06, etc.	150 - 250HB	First choice	AH8015	260 - 660	0.008 - 0.047	
		150 - 250HB	For impact resistance	AH3225	260 - 660	0.008 - 0.047	
S	Titanium alloy Ti-6Al-4V, etc.	- 40HRC	First choice	AH130	100 - 200	0.008 - 0.028	
		- 40HRC	For wear resistance	AH8015	100 - 200	0.008 - 0.028	
	Heat resistant alloy Inconel, Hastelloy, etc.	- 40HRC	First choice	AH8015	70 - 160	0.004 - 0.012	
		- 40HRC	For impact resistance	AH3225	70 - 160	0.004 - 0.012	
H	Hardened steel	H13, etc.	40 - 50HRC	First choice	AH8015	260 - 490	0.004 - 0.020
			40 - 50HRC	For impact resistance	AH3225	260 - 490	0.004 - 0.020
	D2, etc.	50~60HRC	First choice	AH8015	160 - 230	0.004 - 0.012	

APPLICATION RANGE



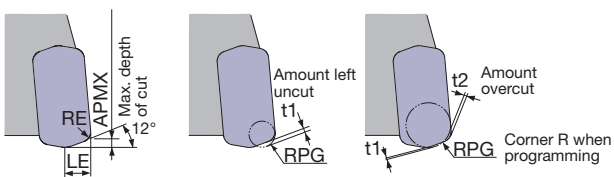
Inch	DCX	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging depth A	Max. cutting width in plunging W	Min. machining øD1	Max. machining øD2	Max. cutting width in enlarged hole ae
EXN02R037U...	0.375	0.020	3.100	0.006	0.079	0.509	0.635	0.289
EXN02R050U...	0.500	0.020	1.780	0.006	0.079	0.760	0.886	0.413
EXN02R062U...	0.625	0.020	1.230	0.006	0.079	1.011	1.137	0.539
EXN02R075U...	0.750	0.020	0.950	0.006	0.079	1.262	1.388	0.664
EXN02R100U...	1.000	0.020	0.640	0.006	0.079	1.756	1.882	0.913

Metric	DCX	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging depth A	Max. cutting width in plunging W	Min. machining øD1	Max. machining øD2	Max. cutting width in enlarged hole ae
HXN02R008...	8	0.5	1.07	0.15	2	10	13.2	5.87
HXN02R010...	10	0.5	2.8	0.15	2	13.8	17	7.82
HXN02R012...	12	0.5	1.9	0.15	2	17.8	21	9.81
HXN02R016...	16	0.5	1.2	0.15	2	25.8	29	13.8
HXN02R020...	20	0.5	0.88	0.15	2	33.8	37	17.8
HXN02M025...	25	0.5	0.66	0.15	2	43.8	47	22.8

Tool dia.: DCX (in), Number of revolutions: n (rpm), Feed speed: V_f (ipm), Max. depth of cut: $a_p = 0.002"$, Number of teeth: CICT

$\phi 0.375"$, CICT = 1		$\phi 0.500"$, CICT = 2		$\phi 0.625"$		$\phi 0.750"$		$\phi 1.000"$				
n	V_f	n	V_f	n	V_f		n	V_f		n	V_f	
					CICT = 3	CICT = 4		CICT = 4	CICT = 5		CICT = 6	CICT = 7
6,720	190	5,040	290	4,030	340	460	3,360	380	480	2,520	430	500
Vc = 660 sfm, fz = 0.028 ipt												
6,720	190	5,040	290	4,030	340	460	3,360	380	480	2,520	430	500
Vc = 660 sfm, fz = 0.028 ipt												
4,990	100	3,740	150	3,000	180	240	2,500	200	250	1,870	230	270
Vc = 490 sfm, fz = 0.020 ipt												
4,180	90	3,130	130	2,510	160	210	2,090	170	210	1,570	190	220
Vc = 410 sfm, fz = 0.020 ipt												
6,720	190	5,040	290	4,030	340	460	3,360	380	480	2,520	430	500
Vc = 660 sfm, fz = 0.028 ipt												
4,990	140	3,740	210	3,000	260	340	2,500	280	350	1,870	320	370
Vc = 490 sfm, fz = 0.028 ipt												
1,530	40	1,150	50	920	60	80	760	70	80	570	70	80
Vc = 150 sfm, fz = 0.020 ipt												
1,220	10	920	20	730	20	30	610	20	30	460	30	30
Vc = 120 sfm, fz = 0.008 ipt												
3,870	50	2,900	70	2,320	90	120	1,940	100	120	1,450	110	130
Vc = 380 sfm, fz = 0.012 ipt												
2,040	20	1,530	30	1,220	30	40	1,020	40	50	760	40	50
Vc = 200 sfm, fz = 0.008 ipt												

TOOL GEOMETRY ON PROGRAMMING

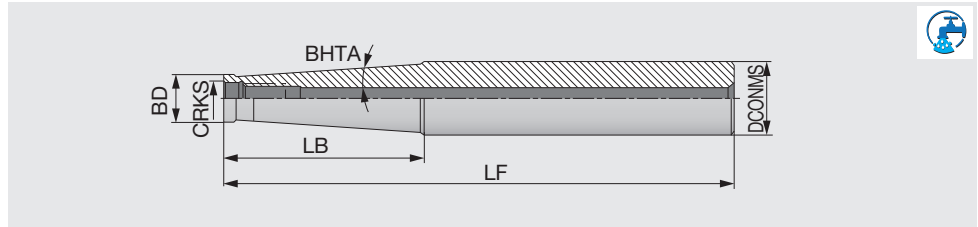


Max. depth of cut APMX (in)	Corner radius RE (in)	LE (in)	Corner R when programming RPG	Amount left uncut t1 (in)	Amount overcut t2 (in)
0.020	0.035	0.079	0.030	0.014	0
0.020	0.035	0.079	0.050	0.008	0.001
0.020	0.035	0.079	0.075	0.001	0.010

*Recommended

TUNGFLEX SM

TungFlex - Modular shank

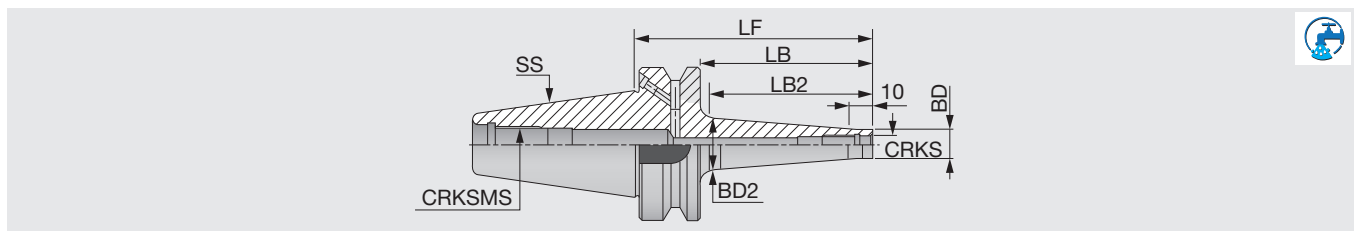


Metric	DCONMS	BD	LF	LB	BHTA	CRKS
SM06-L60C10	10	9.7	60	20	0°	M6
SM06-L105-C12	12	9.7	105	60	1.2°	M6
SM06-L125-C16	16	9.7	125	60	3.3°	M6
SM08-L73C16	16	13	73	25	0°	M8
SM08-L128-C16	16	13	128	80	0.9°	M8
SM08-L170-C20	20	13	170	66.8	3.3°	M8
SM10-L80-C20	20	18	80	30	0°	M10
SM10-L130-C20	20	18	130	80	0.6°	M10
SM10-L200-C25	25	19	200	57.2	3.3°	M10
SM12-L86-C25	25	21	86	30	5.1°	M12
SM12-L200-C32	32	21	200	78	4.4°	M12
SM16-L95-C32	32	29	95	35	1.7°	M16
SM16-L230-C32	32	29	230	50	1.8°	M16

TUNGFLEX

BT-ODP (Screw clamping head holder)

TungFlex modular tooling system with BT shank

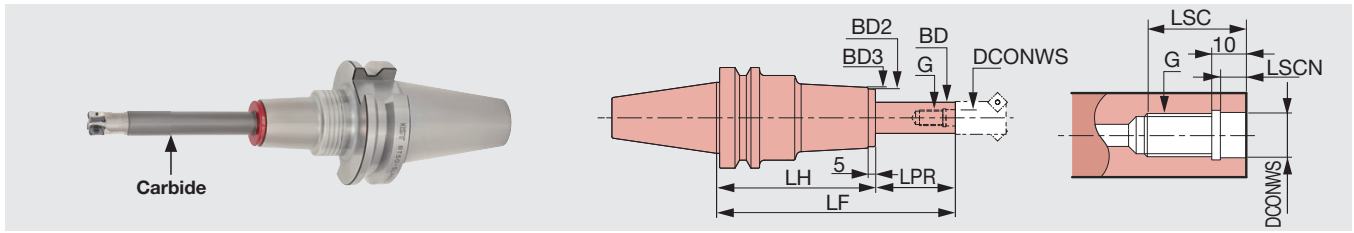


Metric	SS	CRKS	BD	BD2	LF	LB	LB2	CRKSMS
BT40ODP6X66	40	M6	9.8	13	66	39	30	M16
BT40ODP6X106	40	M6	9.8	23	106	79	70	M16
BT40ODP8X66	40	M8	13	15	66	39	30	M16
BT40ODP8X106	40	M8	13	23	106	79	70	M16
BT40ODP10X66	40	M10	18	20	66	39	30	M16
BT40ODP10X106	40	M10	18	28	106	79	70	M16
BT40ODP12X66	40	M12	21	24	66	39	30	M16
BT40ODP12X106	40	M12	21	31	106	79	70	M16
BT40ODP16X66	40	M16	29	28.6	66	39	-	M16
BT40ODP16X106	40	M16	29	34	106	79	70	M16
BT50ODP12X94	50	M12	23	30	94	56	50	M24
BT50ODP12X144 ⁽¹⁾	50	M12	23	40	144	106	100	M24
BT50ODP12X194 ⁽¹⁾	50	M12	23	40	194	156	150	M24
BT50ODP12X244 ⁽¹⁾	50	M12	23	46	244	206	200	M24
BT50ODP16X94 ⁽¹⁾	50	M16	29	34	94	56	50	M24
BT50ODP16X144 ⁽¹⁾	50	M16	29	40	144	106	100	M24
BT50ODP16X194 ⁽¹⁾	50	M16	29	55	194	156	150	M24
BT50ODP16X244 ⁽¹⁾	50	M16	29	60	244	206	200	M24

• Applicable for 10 MPa pressure coolant ⁽¹⁾ Balanced to G6.3 at 12,000 min⁻¹

BT-RSG (Screw clamping head holder)



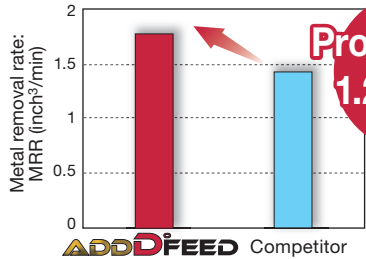
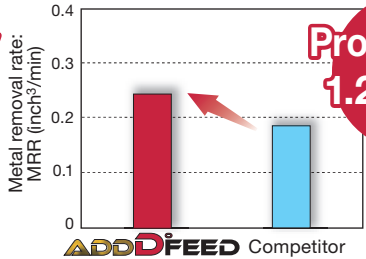
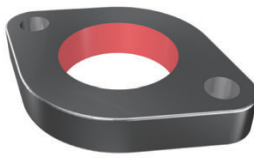
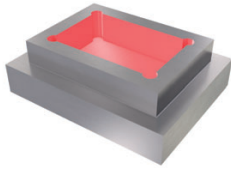
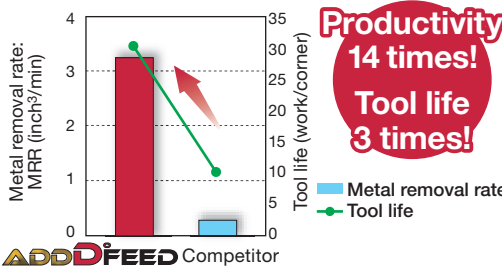
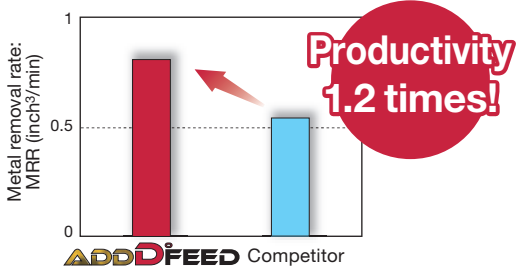
TungFlex modular tooling system with BT shank



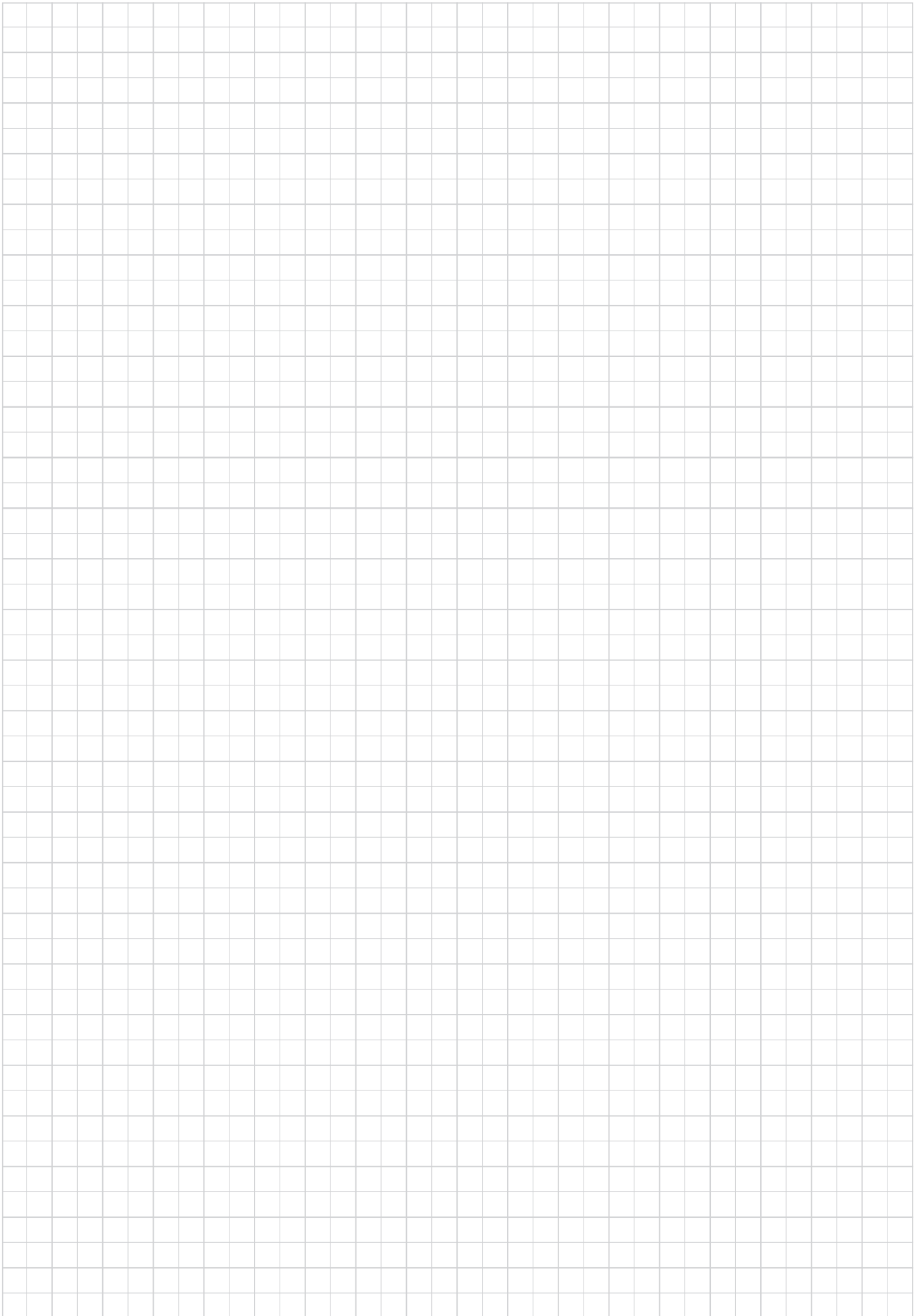
Metric	DCONWS	LSC	LSCN	BD	LF	LPR	LH	BD2	BD3	WT (kg)	G
BT40-RSG 8-105-M 25	8.5	18	6.5	15	105	25	80	30	32	1.4	M8
BT40-RSG 8-135-M 25	8.5	18	6.5	15	135	25	110	30	32	1.8	M8
BT40-RSG 8-130-M 50	8.5	18	6.5	15	130	50	80	30	32	1.4	M8
BT40-RSG 8-160-M 50	8.5	18	6.5	15	160	50	110	30	32	1.8	M8
BT40-RSG 8-155-M 75	8.5	18	6.5	15	155	75	80	30	32	1.5	M8
BT40-RSG 8-185-M 75	8.5	18	6.5	15	185	75	110	30	32	1.9	M8
BT40-RSG 10-125-M 25	10.5	22	6.5	19	125	25	100	36	38	1.8	M10
BT40-RSG 10-155-M 25	10.5	22	6.5	19	155	25	130	36	38	2.2	M10
BT40-RSG 10-150-M 50	10.5	22	6.5	19	150	50	100	36	38	1.9	M10
BT40-RSG 10-180-M 50	10.5	22	6.5	19	180	50	130	36	38	2.3	M10
BT40-RSG 10-175-M 75	10.5	22	6.5	19	175	75	100	36	38	2	M10
BT40-RSG 10-205-M 75	10.5	22	6.5	19	205	75	130	36	38	2.4	M10
BT40-RSG 10-200-M100	10.5	22	6.5	19	200	100	100	36	38	2	M10
BT40-RSG 10-230-M100	10.5	22	6.5	19	230	100	130	36	38	2.4	M10
BT40-RSG 12-125-M 25	12.5	22	6	24	125	25	100	43	45	2	M12
BT40-RSG 12-155-M 25	12.5	22	6	24	155	25	130	43	45	2.4	M12
BT40-RSG 12-150-M 50	12.5	22	6	24	150	50	100	43	45	2.1	M12
BT40-RSG 12-180-M 50	12.5	22	6	24	180	50	130	43	45	2.5	M12
BT40-RSG 12-175-M 75	12.5	22	6	24	175	75	100	43	45	2.3	M12
BT40-RSG 12-205-M 75	12.5	22	6	24	205	75	130	43	45	2.7	M12
BT40-RSG 12-200-M100	12.5	22	6	24	200	100	100	43	45	2.4	M12
BT40-RSG 12-230-M100	12.5	22	6	24	230	100	130	43	45	2.8	M12
BT50-RSG 8-120-M 25	8.5	18	6.5	15	120	25	95	30	32	4	M8
BT50-RSG 8-150-M 25	8.5	18	6.5	15	150	25	125	30	32	4.3	M8
BT50-RSG 8-145-M 50	8.5	18	6.5	15	145	50	95	30	32	4	M8
BT50-RSG 8-175-M 50	8.5	18	6.5	15	175	50	125	30	32	4.3	M8
BT50-RSG 8-170-M 75	8.5	18	6.5	15	170	75	95	30	32	4.1	M8
BT50-RSG 8-200-M 75	8.5	18	6.5	15	200	75	125	30	32	4.4	M8
BT50-RSG 10-140-M 25	10.5	22	6.5	19	140	25	115	36	38	4.3	M10
BT50-RSG 10-170-M 25	10.5	22	6.5	19	170	25	145	36	38	4.6	M10
BT50-RSG 10-165-M 50	10.5	22	6.5	19	165	50	115	36	38	4.4	M10
BT50-RSG 10-195-M 50	10.5	22	6.5	19	195	50	145	36	38	4.7	M10
BT50-RSG 10-190-M 75	10.5	22	6.5	19	190	75	115	36	38	4.5	M10
BT50-RSG 10-220-M 75	10.5	22	6.5	19	220	75	145	36	38	4.8	M10
BT50-RSG 10-215-M100	10.5	22	6.5	19	215	100	115	36	38	4.5	M10
BT50-RSG 10-245-M100	10.5	22	6.5	19	245	100	145	36	38	4.8	M10
BT50-RSG 12-140-M 25	12.5	22	6	24	140	25	115	43	45	4.6	M12
BT50-RSG 12-170-M 25	12.5	22	6	24	170	25	145	43	45	5	M12
BT50-RSG 12-165-M 50	12.5	22	6	24	165	50	115	43	45	4.7	M12
BT50-RSG 12-195-M 50	12.5	22	6	24	195	50	145	43	45	5.1	M12
BT50-RSG 12-190-M 75	12.5	22	6	24	190	75	115	43	45	4.9	M12
BT50-RSG 12-220-M 75	12.5	22	6	24	220	75	145	43	45	5.3	M12
BT50-RSG 12-215-M100	12.5	22	6	24	215	100	115	43	45	5	M12
BT50-RSG 12-245-M100	12.5	22	6	24	245	100	145	43	45	5.4	M12
BT50-RSG 12-240-M125	12.5	22	6	24	240	125	115	43	45	5.2	M12
BT50-RSG 16-140-M 25	17	25	6	29	140	25	115	52	54	5.4	M16
BT50-RSG 16-165-M 50	17	25	6	29	165	50	115	52	54	5.6	M16
BT50-RSG 16-190-M 75	17	25	6	29	190	75	115	52	54	5.8	M16
BT50-RSG 16-215-M100	17	25	6	29	215	100	115	52	54	6	M16
BT50-RSG 16-240-M125	17	25	6	29	240	125	115	52	54	6.2	M16

Manufactured by: **MST** corporation

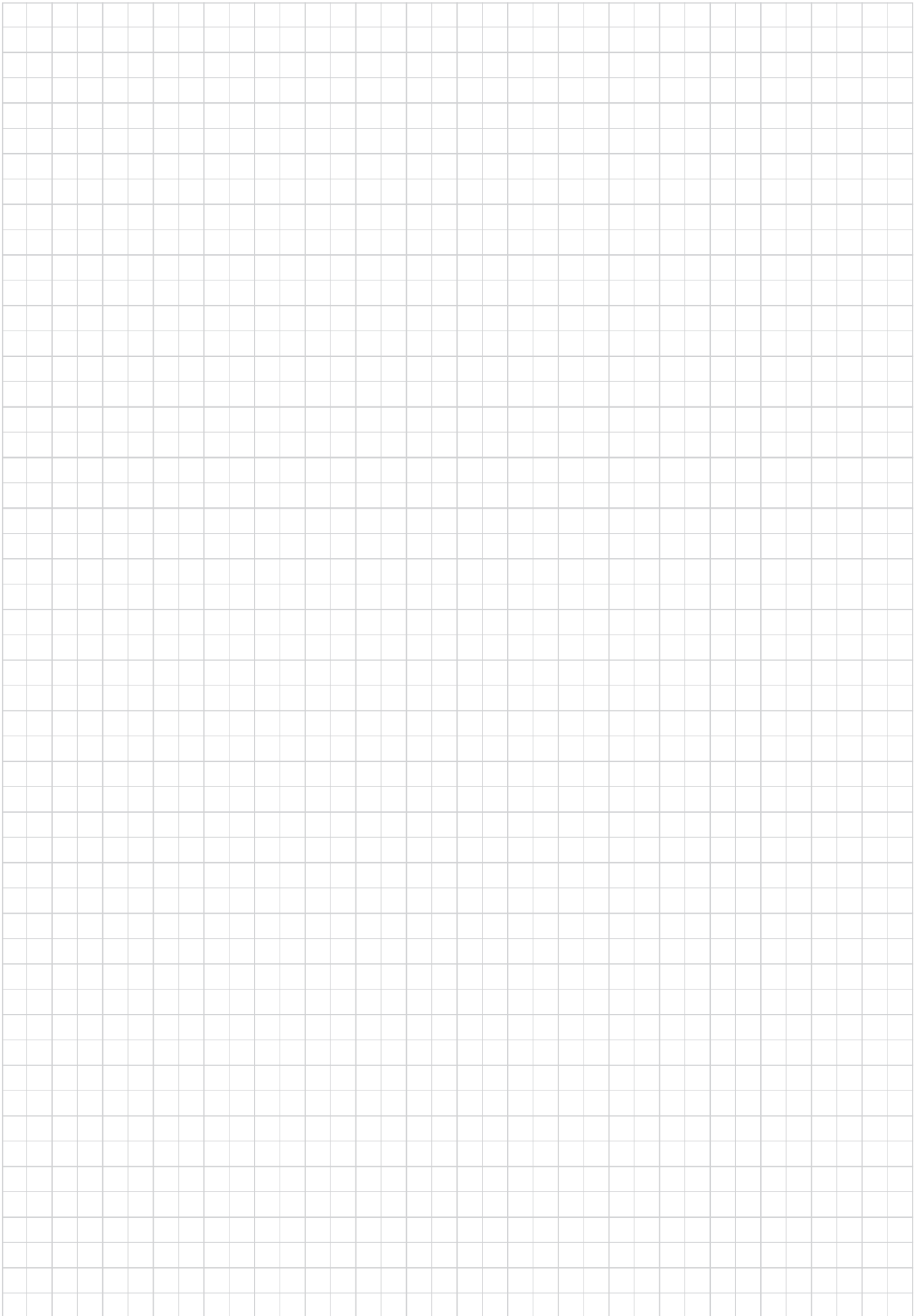
PRACTICAL EXAMPLES

Workpiece type		Compressor shaft	Gas turbine component
Cutter		EXN02R037U0037-01 ($\phi 0.375"$, $z = 1$)	EXN02R050U0050-02 ($\phi 0.500"$, $z = 2$)
Insert		LNMU0202ZER-MM	LNMU0202ZER-MM
Grade		AH3225 4340 (42HRC)	AH130 Heat-resistant steel
Workpiece material		 P	 M
Cutting conditions	Cutting speed :Vc (sfm)	591	197
	Feed per tooth :fz (ipt)	0.024	0.020
	Depth of cut :ap (in)	0.016	0.012
	Width of cut :ae (in)	0.394	0.315
	Process	Slotting	Shoulder milling
	Coolant	Wet	Wet
Machine		Vertical M/C, CAT30	Vertical M/C, CAT50
Results		 <p>Productivity 1.2 times!</p> <p>AddDoFeed eliminated chatter despite high cutting speed thanks to low cutting force, gaining productivity by 1.2 times.</p>	 <p>Productivity 1.2 times!</p> <p>AddDoFeed's small depth of cut, but much faster feed improved productivity by 1.2 times.</p>
Workpiece type		Flange	Die and mold
Cutter		EXN02R100U0100-07 ($\phi 1.000"$, $z = 7$)	EXN02R050U0050-02 ($\phi 0.500"$, $z = 2$)
Insert		LNMU0202ZER-MM	LNMU0202ZER-MM
Grade		AH8015 S34700	AH8015 4340
Workpiece material		 M	 H
Cutting conditions	Cutting speed :Vc (sfm)	722	495
	Feed per tooth :fz (ipt)	0.008	0.012
	Depth of cut :ap (in)	0.020	0.020
	Width of cut :ae (in)	0.984	- 0.472
	Process	Hole enlarging	Pocketing
	Coolant	Wet	Wet
Machine		Vertical M/C, CAT50	Vertical M/C, CAT50
Results		 <p>Productivity 14 times! Tool life 3 times!</p> <p>Thanks to AddDoFeed's excellent chip control there is no chip re-cutting. Productivity is improved by 14 times with 3 times the tool life.</p>	 <p>Productivity 1.2 times!</p> <p>High wear resistant grade AH8015 has eliminated rapid insert wear during hardened steel machining, providing 1.2 times productivity by increasing cutting speed.</p>

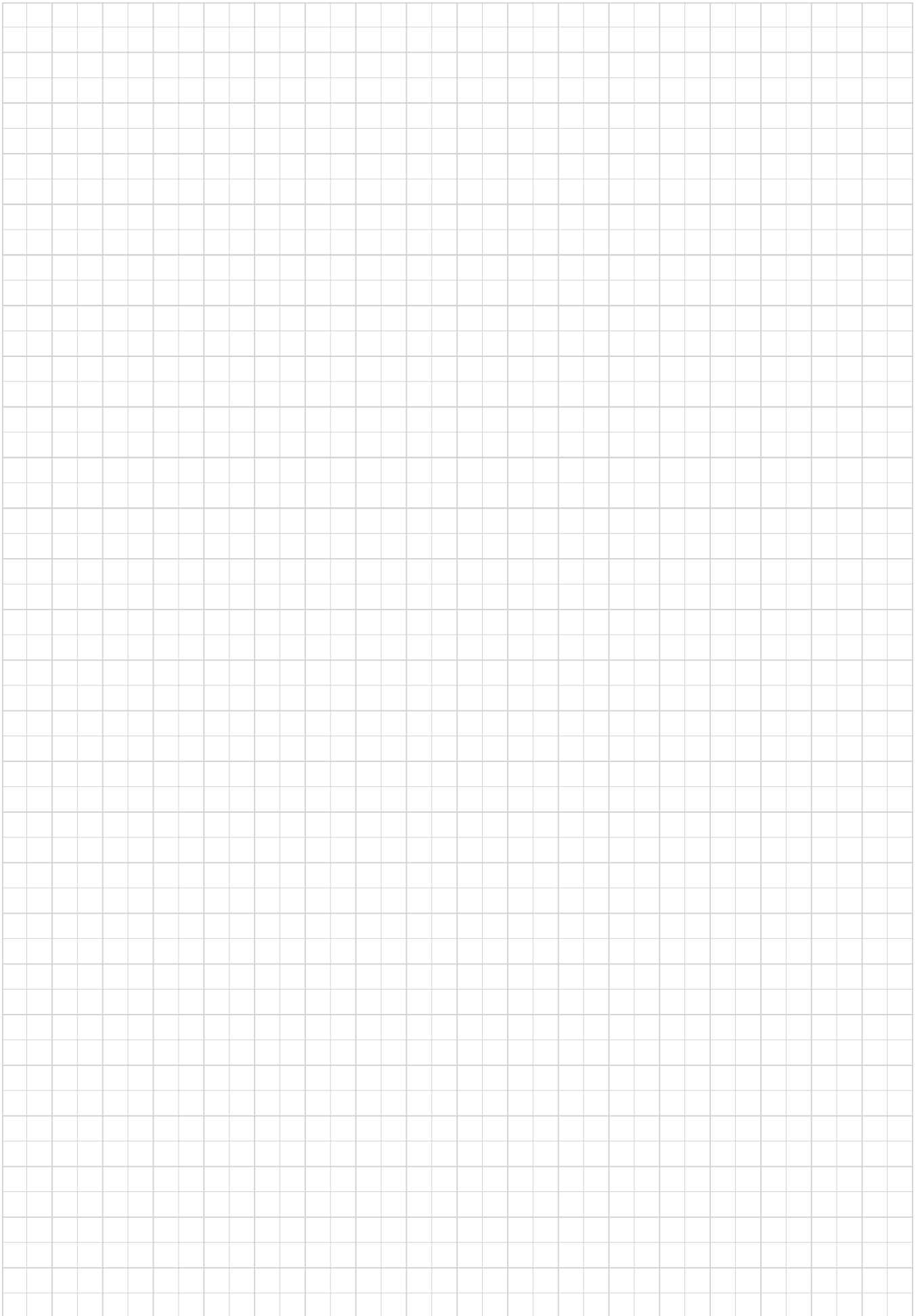
MEMO



MEMO



MEMO



Tungaloy America, Inc.

3726 N Ventura Drive, Arlington Heights, IL 60004, U.S.A.

Inside Sales: +1-888-554-8394

Technical Support: +1-888-554-8391

Fax: +1-888-554-8392

www.tungaloy.com/us

Tungaloy Canada

432 Elgin St. Unit 3, Brantford, Ontario N3S 7P7, Canada

Phone: +1-519-758-5779 Fax: +1-519-758-5791

www.tungaloy.com/ca

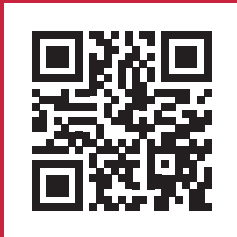
Tungaloy de Mexico S.A.

C Los Arellano 113, Parque Industrial Siglo XXI

Aguascalientes, AGS, Mexico 20290

Phone: +52-449-929-5410 Fax: +52-449-929-5411

www.tungaloy.com/mx



Scan for instant
web access



www.tungaloy.com/us

follow us at:

facebook.com/tungaloyamerica

twitter.com/tungaloy

instagram.com/tungaloyamerica

linkedin.com/company/tungaloy-america

To see Tungaloy products in action visit:



www.youtube.com/tungaloycorporation

Distributed by:



FIND US ON THE CLOUD!
machiningcloud.com



Oct. 2021 (TJ)