Member IMC Group Tungaloy INDUSTRY 4.0

MillLine

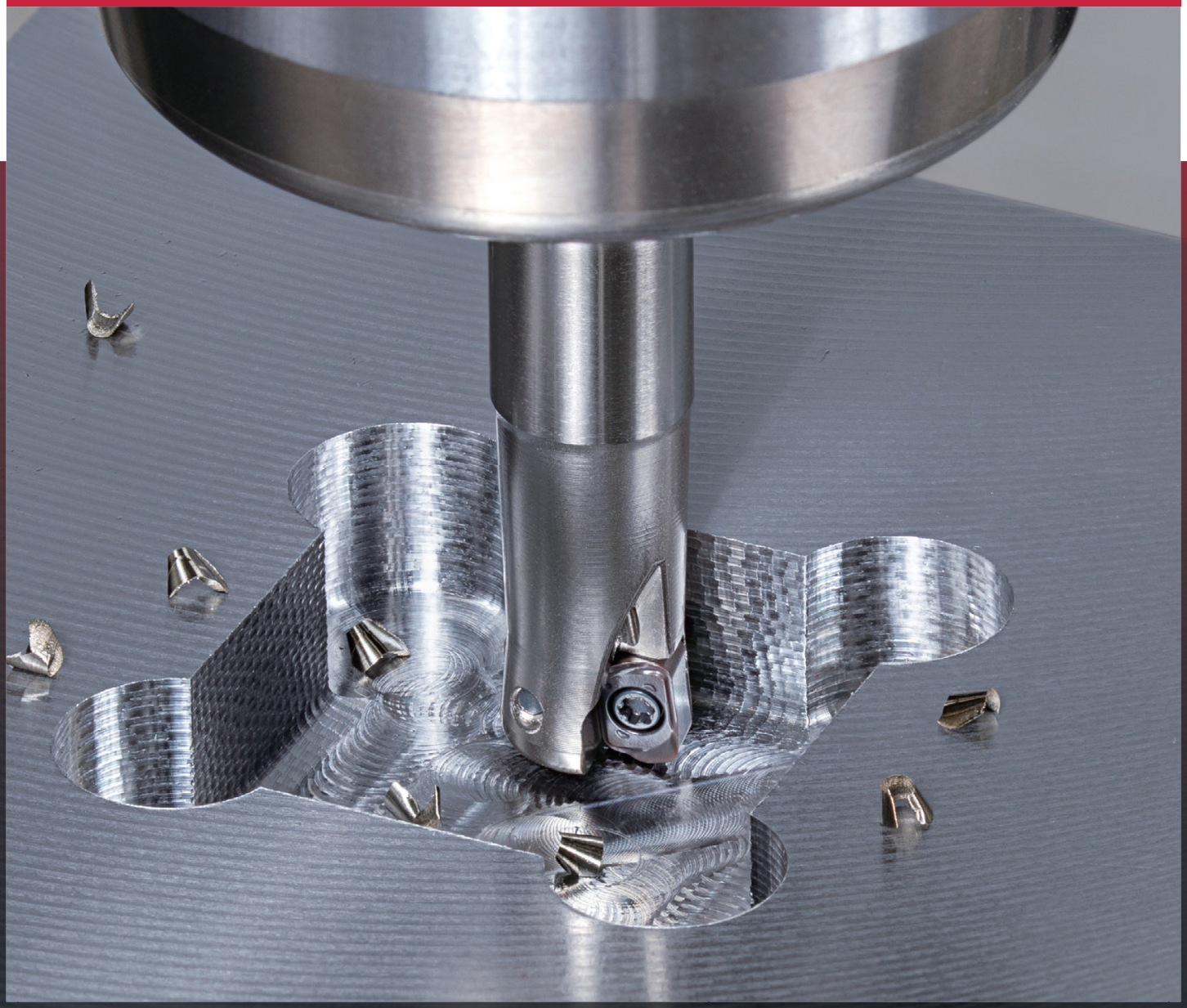
High feed milling tool

ADDFEED

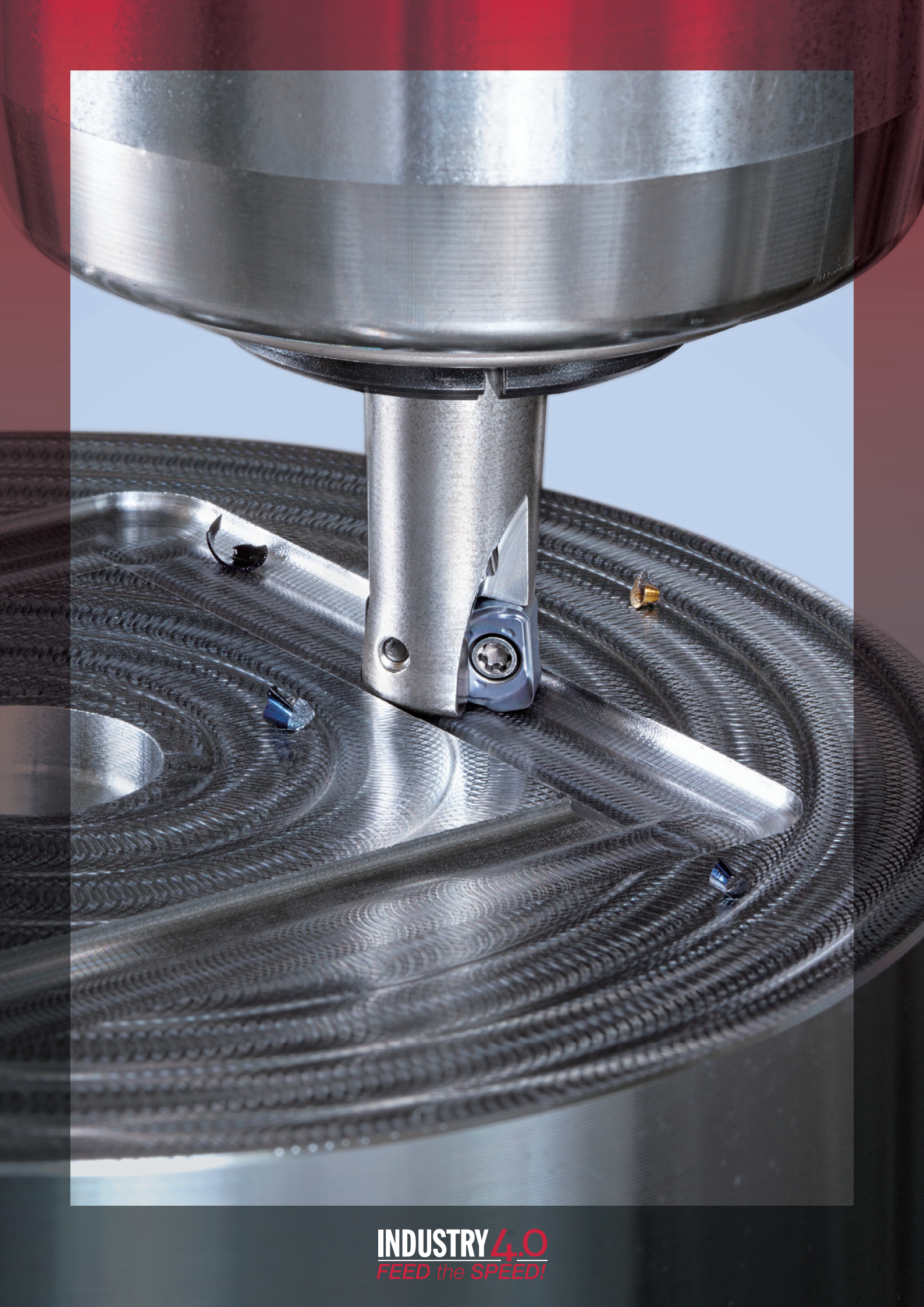
Tungaloy Report No. 545-G

Small diameter high feed milling solution

A great cost saving alternative for solid carbide end mills



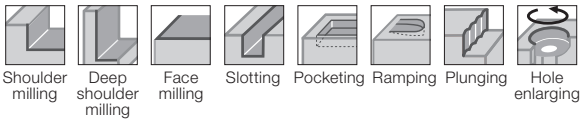
TUNGALOY ADDFORCE ACCELERATED LINES


INDUSTRY 4.0
FEED the SPEED!

TUNGALOY ADDFORCE MILL
ACCELERATED MILLING

ADDDFEED

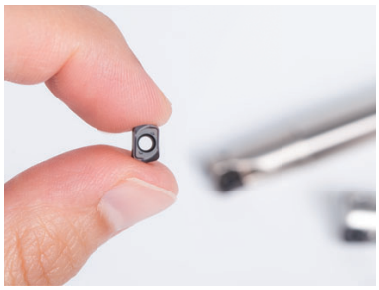
Small, robust double-sided 4 cutting edged insert for high feed milling

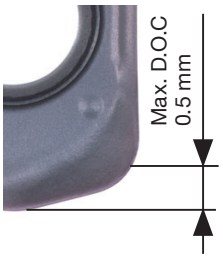


Small inserts, close pitch design

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

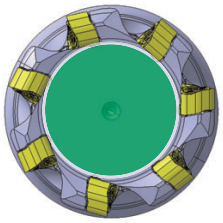
AddDoFeed 02 inserts for cutter diameters ø8 - 25 mm





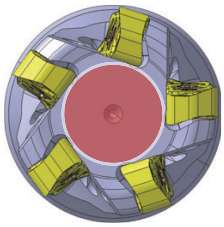
Small inserts enable close pitch and rigid design

ADDDOFEED



Large web thickness

Competitor



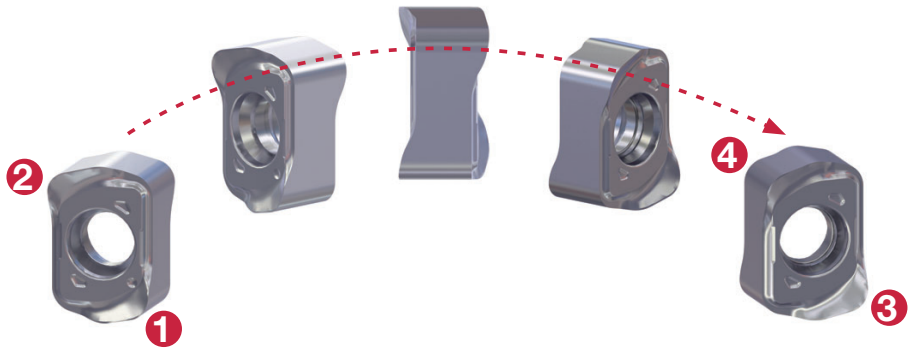
Conventional web thickness

Number of inserts per diameter comparison

Tool dia. DCX (mm)	No. of inserts (z)		
	ADDDOFEED	DOFEED 03	Competitor
ø8	1	-	-
ø10	2	-	-
ø12	2	-	-
ø16	4	2	2
ø20	5	4	3
ø25	7	5	4

Economical 4-cutting edged insert

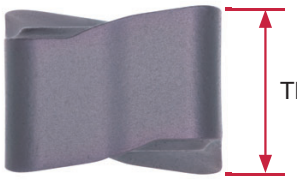
Double-sided, 4-cutting edged insert - an unprecedented insert design for cutters in the small diameter range



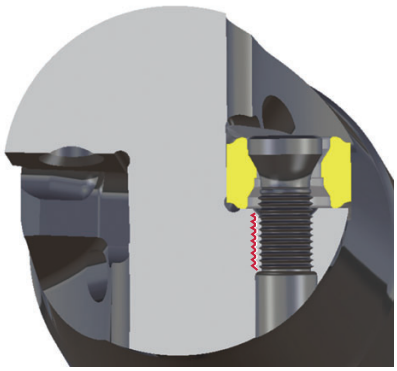
High tool rigidity

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



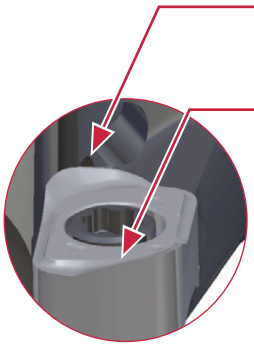
Screw hole cross section

Fine screw thread

Coarse screw thread

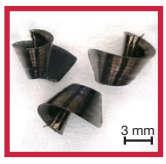
Effective chip evacuation

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



Optimized jet coolant delivery effectively removes chip and prevents it from being re-cut

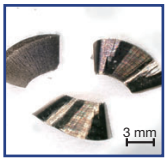
Large inclination forms ideal chips and controls the chips flow



ADDDOFEED

Good

Curl consistently at ideal shape



Competitor

Poor

Crushed or unstable

P

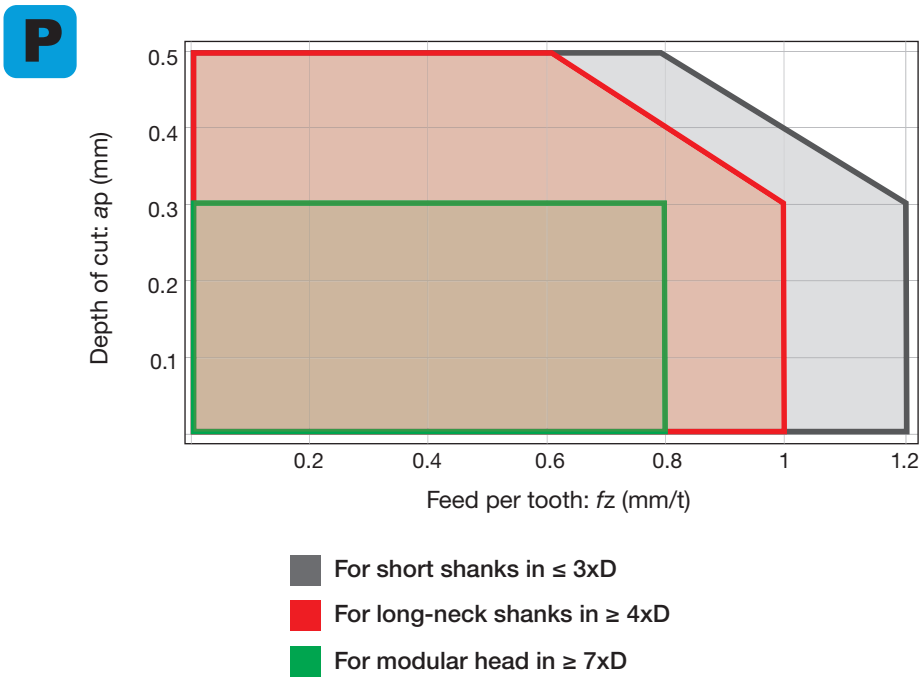
Cutter	: EXN02R012M12.0-02 (ø12 mm, z = 2)
Insert	: LNMU0202ZWR-MM AH3225
Workpiece material	: Carbon steels (S55C / C55)
Cutting speed	: *Vc* = 200 m/min
Feed per tooth	: *fz* = 1 mm/t
Depth of cut	: *ap* =0.5 mm
Coolant	: Dry
Machine	: Vertical M/C, BT30

Three cutter body styles

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

Short shank	Long-neck shank	Modular head
	 Long reduced neck prevents workpiece interference	
Rigid tool body for high efficiency machining	For long reach applications	Couple with tapered shank or carbide shank for increased rigidity

APPLICATION



Tool selection guide

AddDoFeed is the most powerful tool option in diameter range ø8 - 25 mm at ap ≤ 0.5 mm

1st choice

ADDDOFEED 

- High productivity
- Economic
- Low cutting force

2nd choice

TUNGFORCEFEED 

- More density
- Long tool life in difficult-to-cut materials
- Positive insert with low cutting force

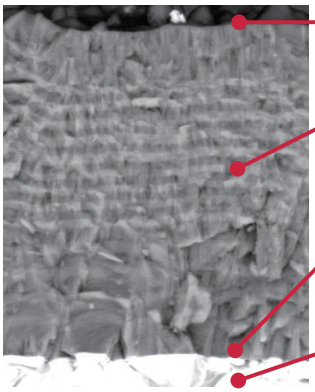
TUNGMEISTER 

- More density (6 flutes in ø12 and ø16

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

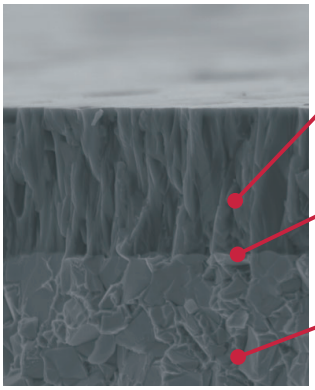
Resistance to wear, oxidation, and fracture
Multi-layered coating is designed to resist wear and oxidation, while preventing micro-cracks from propagating in the coating layer for improved resistance to edge chipping

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



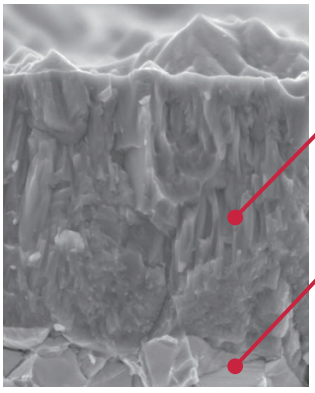
Flash-coat (Ti,Al)N based PVD coated grade
Excellent anti-welding and -oxidation properties
Super wear resistance

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

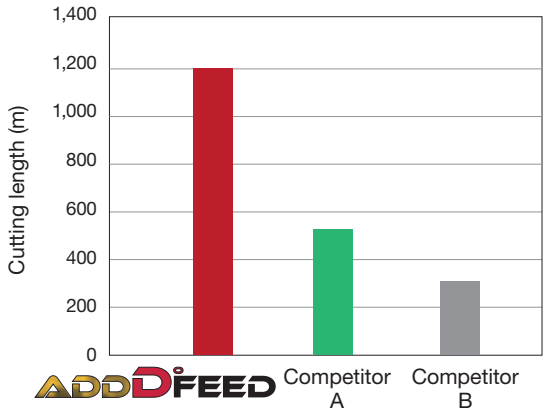


Extremely hard layer of nano multi-layered AlTiN coating with high Al content
Increases hardness by 20 %
Prevents micro cracks from developing

Carbide substrate
High resistance to wear

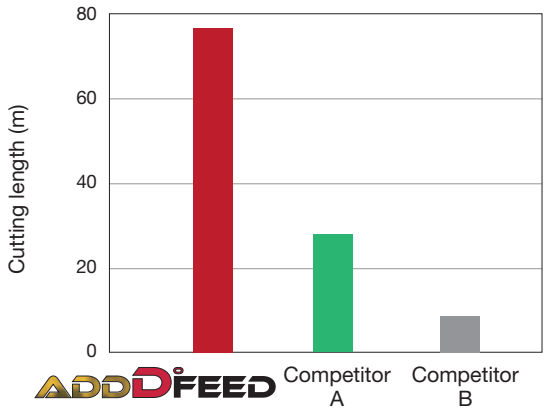
CUTTING PERFORMANCE

P S55C / C55 (190HB)



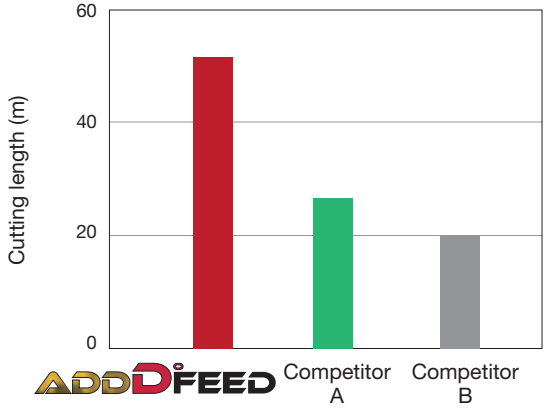
Cutter	: EXN02R012M12.0-02 (ø12 mm, z = 2)
Insert	: LNMU0202ZER-MM AH3225
Tool overhang	: 30 mm
Cutting speed	: *Vc* = 250 m/min
Feed per tooth	: *fz* = 0.6 mm/t
Depth of cut	: *ap* = 0.4 mm
Width of cut	: *ae* = 9.8 mm
Coolant	: Dry
Machine	: Vertical M/C, BT40

M SUS304 / X5CrNi18-9 (190HB)



Cutter	: EXN02R012M12.0-02 (ø12 mm, z = 2)
Insert	: LNMU0202ZER-MM AH130
Tool overhang	: 30 mm
Cutting speed	: *Vc* = 180 m/min
Feed per tooth	: *fz* = 0.3 mm/t
Depth of cut	: *ap* = 0.3 mm
Width of cut	: *ae* = 9.8 mm
Coolant	: Wet
Machine	: Vertical M/C, BT40

H SKD61 (52HRC)

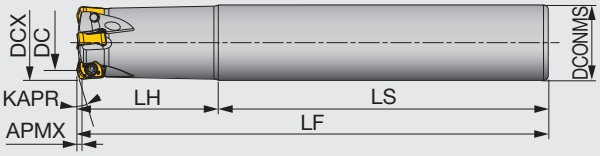


Cutter	: EXN02R012M12.0-02 (ø12 mm, z = 2)
Insert	: LNMU0202ZER-MM AH8015
Tool overhang	: 30 mm
Cutting speed	: *Vc* = 120 m/min
Feed per tooth	: *fz* = 0.5 mm/t
Depth of cut	: *ap* = 0.3 mm
Width of cut	: *ae* = 9.8 mm
Coolant	: Dry
Machine	: Vertical M/C, BT40

EXN02

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

GAMP = +6°, GAMF = +5° ~ +11°



Designation	APMX	DCX	CICT	DC	DCONMS	LF	LH	LS	KAPR	WT (kg)	Air hole	Insert
EXN02R008M08.0-01	0.5	8	1	3.95	8	75	16	59	17°	0.02	With	LNMU02…
EXN02R008M08.0-01L	0.5	8	1	3.95	8	90	31	59	17°	0.03	With	LNMU02…
EXN02R010M10.0-02	0.5	10	2	5.85	10	80	20	60	17°	0.04	With	LNMU02…
EXN02R010M10.0-02L	0.5	10	2	5.85	10	100	40	60	17°	0.05	With	LNMU02…
EXN02R012M12.0-02	0.5	12	2	7.8	12	80	20	60	17°	0.06	With	LNMU02…
EXN02R012M12.0-02L	0.5	12	2	7.8	12	110	50	60	17°	0.08	With	LNMU02…
EXN02R016M16.0-04	0.5	16	4	11.8	16	100	30	70	17°	0.14	With	LNMU02…
EXN02R016M16.0-03L	0.5	16	3	11.8	16	120	50	70	17°	0.17	With	LNMU02…
EXN02R020M20.0-04L	0.5	20	4	15.8	20	160	80	80	17°	0.32	With	LNMU02…
EXN02R020M20.0-05	0.5	20	5	15.8	20	130	50	80	17°	0.27	With	LNMU02…
EXN02R025M25.0-07	0.5	25	7	20.8	25	140	60	80	17°	0.46	With	LNMU02…
EXN02R025M25.0-06L	0.5	25	6	20.8	25	180	100	80	17°	0.57	With	LNMU02…

SPARE PARTS

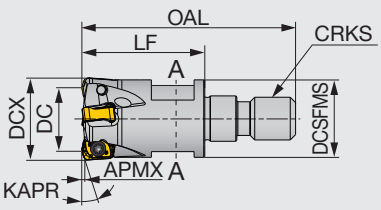
Designation	Clamping screw	Wrench
EXN02R008...	CSPB-1.8FL3.6	IP-6DB
EXN02R010...	CSPB-1.8FL4.3	IP-6DB
EXN02R012...	CSPB-1.8FL4.3	IP-6DB
EXN02R016...	CSPB-1.8FL4.3	IP-6DB
EXN02R020...	CSPB-1.8FL4.3	IP-6DB
EXN02R025...	CSPB-1.8FL4.3	IP-6DB

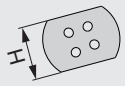
TUNGFLEX

HXN02

High feed endmill, modular type (TungFlex)

GAMP = +6°, GAMF = +5° ~ +11°





A-A cross section

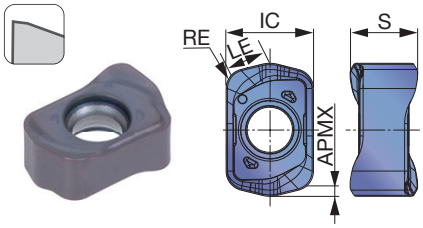
Designation	APMX	DCX	CICT	DC	DCSFMS	OAL	LF	H	KAPR	CRKS	WT (kg)	Air hole	Insert
HXN02R008MM06-01	0.5	8	1	3.95	9.5	33.5	19	7	17°	M6	0.01	With	LNMU02…
HXN02R010MM06-02	0.5	10	2	5.85	9.5	31.5	17	7	17°	M6	0.01	With	LNMU02…
HXN02R012MM06-02	0.5	12	2	7.8	10	31.5	17	7	17°	M6	0.01	With	LNMU02…
HXN02R016MM08-04	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

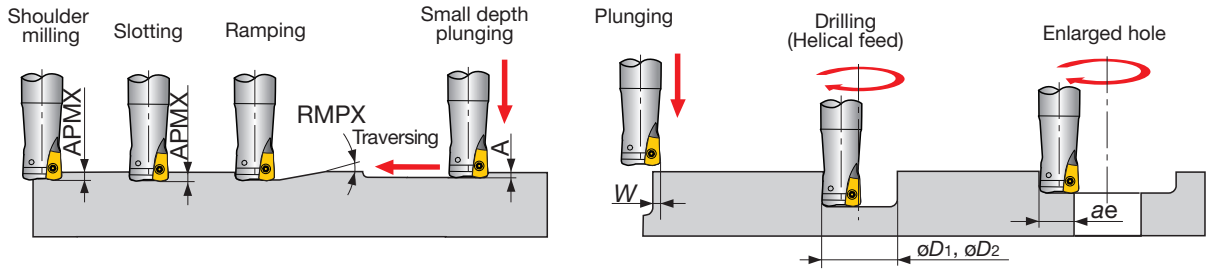
Designation	RE	APMX	Coated			LE	IC	S
			AH130	AH3225	AH8015			
LNMU0202ZER-MM	0.9	0.5	●	●	●	1.79	4	3.1

●: Line up

STANDARD CUTTING CONDITIONS

ISO	Workpiece materials		Hardness	Priority	Grades	Cutting speed *Vc* (m/min)	Feed per tooth *fz* (mm/t)
P	Carbon steels S45C / C45, S55C / C55, etc.		- 300HB	First choice	AH3225	100 - 300	0.2 - 1.2
			- 300HB	For wear resistance	AH8015	100 - 300	0.2 - 1.2
	Alloy steels SCM440 / 42CrMo4, etc.		- 300HB	First choice	AH3225	100 - 300	0.2 - 1.2
			- 300HB	For wear resistance	AH8015	100 - 300	0.2 - 1.2
	Prehardened steels NAK80, PX5, etc.		30 - 40HRC	First choice	AH8015	100 - 200	0.2 - 0.8
			30 - 40HRC	For impact resistance	AH3225	100 - 200	0.2 - 0.8
M	Stainless steels SUS304 / X5CrNi18-9, SUS316 / X5CrNiMo17-12-3, etc.		- 200HB	First choice	AH130	100 - 150	0.2 - 0.8
K	Gray cast irons FC250 / 250 / GG25, FC300 / 300 / GG30, etc.		150 - 250HB	First choice	AH8015	100 - 300	0.2 - 1.2
			150 - 250HB	For impact resistance	AH3225	100 - 300	0.2 - 1.2
	Ductile cast irons FCD600 / 600-3 / GGG60, etc.		150 - 250HB	First choice	AH8015	80 - 200	0.2 - 1.2
			150 - 250HB	For impact resistance	AH3225	80 - 200	0.2 - 1.2
S	Titanium alloy Ti-6Al-4V, etc.		- 40HRC	First choice	AH130	30 - 60	0.2 - 0.7
			- 40HRC	For wear resistance	AH8015	30 - 60	0.2 - 0.7
	Heat resistant alloy Inconel, Hastelloy, etc.		- 40HRC	First choice	AH8015	20 - 50	0.1 - 0.3
			- 40HRC	For impact resistance	AH3225	20 - 50	0.1 - 0.3
H	Hardened steel	SKD61 / X40CrMoV5-1, etc.	40 - 50HRC	First choice	AH8015	80 - 150	0.1 - 0.5
			40 - 50HRC	For impact resistance	AH3225	80 - 150	0.1 - 0.5
		SKD11 / X153CrMoV12, etc.	50~60HRC	First choice	AH8015	50 - 70	0.1 - 0.3

APPLICATION RANGE

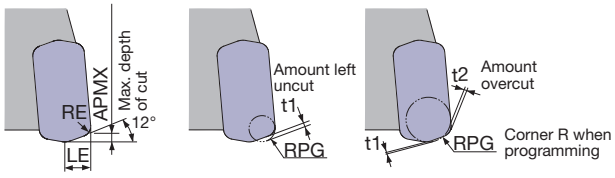


Designation	DCX	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging depth A	Max. cutting width in plunging W	Min. machining øD1	Max. machining øD2	Max. cutting width in enlarged hole ae
E/HXN02R008...	8	0.5	1.07	0.15	2	10	13.2	5.87
E/HXN02R010...	10	0.5	2.8	0.15	2	13.8	17	7.82
E/HXN02R012...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

Tool dia.: ø*D*c (mm), Number of revolutions: *n* (min-1), Feed speed: *V*f (mm/min), Max. depth of cut: *a*p = 0.5 mm, Number of teeth: CICT

ø8, CICT = 1		ø10, CICT = 2		ø12, CICT = 2		ø16			ø20			ø25		
n	*V*f	*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
7,960	6,370	6,370	10,200	5,310	8,500	3,980	9,560	12,740	3,180	10,180	12,720	2,550	12,240	14,280
						*V*c = 200 m/min, *f*z = 0.8 mm/t								
7,960	6,370	6,370	10,200	5,310	8,500	3,980	9,560	12,740	3,180	10,180	12,720	2,550	12,240	14,280
						*V*c = 200 m/min, *f*z = 0.8 mm/t								
5,970	2,990	4,780	4,780	3,980	3,980	2,990	4,490	5,980	2,390	4,780	5,980	1,910	5,730	6,690
						*V*c = 150 m/min, *f*z = 0.5 mm/t								
4,780	2,390	3,820	3,820	3,190	3,190	2,390	3,590	4,780	1,910	3,820	4,780	1,530	4,590	5,360
						*V*c = 120 m/min, *f*z = 0.5 mm/t								
7,960	6,370	6,370	10.200	5,310	8,500	3,980	9,560	12,740	3,180	10,180	12,720	2,550	12,240	14,280
						*V*c = 200 m/min, *f*z = 0.8 mm/t								
5,970	4,780	4,780	7,650	3,980	6,370	2,990	7,180	9,570	2,390	7,650	9,560	1,530	7,350	8,570
						*V*c = 150 m/min, *f*z = 0.8 mm/t								
1,590	800	1,270	1,270	1,060	1,060	800	1,200	1,600	640	1,280	1,600	510	1,530	1,790
						*V*c = 40 m/min, *f*z = 0.5 mm/t								
1,190	240	1,000	400	800	320	600	360	480	480	390	480	380	460	540
						*V*c = 30 m/min, *f*z = 0.2 mm/t								
4,780	1,440	3,820	2,300	3,190	1,920	2,390	2,160	2,870	1,910	2,300	2,870	1,530	2,760	3,220
						*V*c = 120 m/min, *f*z = 0.3 mm/t								
2,390	480	1,910	770	1,590	640	1,190	720	960	950	760	950	760	920	1,070
						*V*c = 60 m/min, *f*z = 0.2 mm/t								

TOOL GEOMETRY ON PROGRAMMING

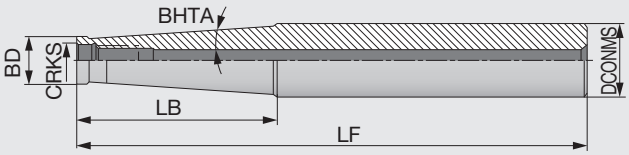


Max. depth of cut APMX (mm)	Corner radius RE (mm)	LE (mm)	Corner R when programming RPG	Amount left uncut t1 (mm)	Amount overcut t2 (mm)
0.5	0.9	2	0.5	0.38	0
0.5	0.9	2	0.8	0.31	0
0.5	**0.9**	**2**	**1**	**0.26**	**0**
0.5	0.9	2	1.5	0.14	0.08

*Recommended

TUNGFLEX
SM

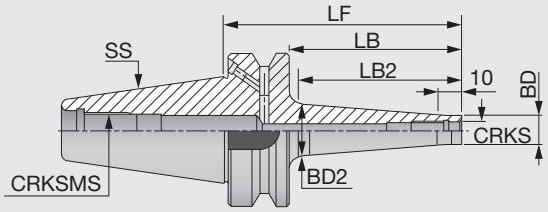
TungFlex - Modular shank



Designation	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

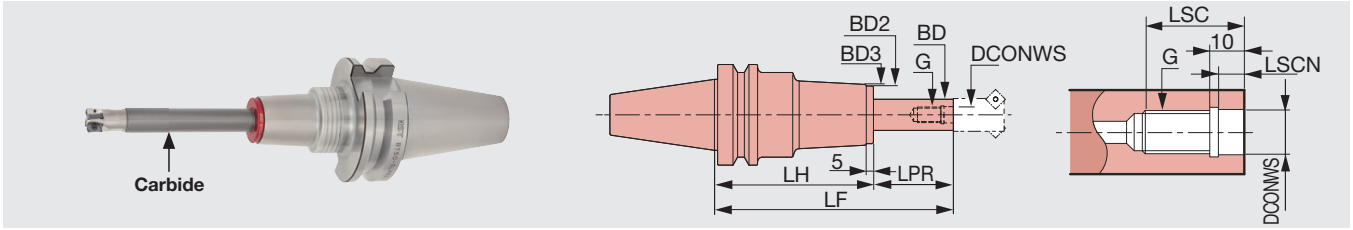


Designation	SS	CRKS	BD	BD2	LF	LB	LB2	CRKSMS
BT40ODP6X66	40	M6	9.8	13	66	39	30	M16
BT40ODP6X106	40	M6	9.8	23	106	79	70	M16
BT40ODP8X66	40	M8	13	15	66	39	30	M16
BT40ODP8X106	40	M8	13	23	106	79	70	M16
BT40ODP10X66	40	M10	18	20	66	39	30	M16
BT40ODP10X106	40	M10	18	28	106	79	70	M16
BT40ODP12X66	40	M12	21	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)

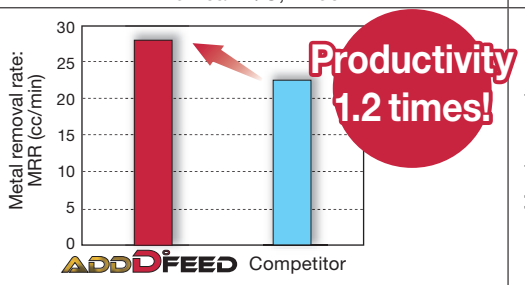
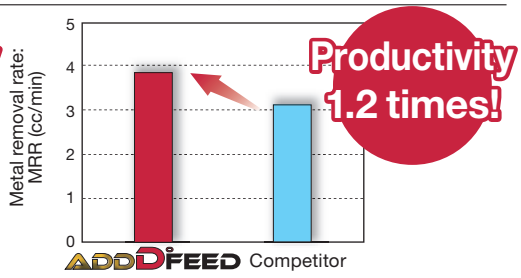
TungFlex modular tooling system with BT shank

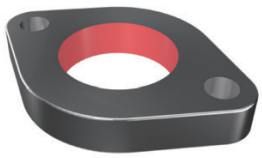
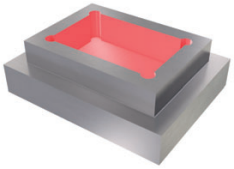
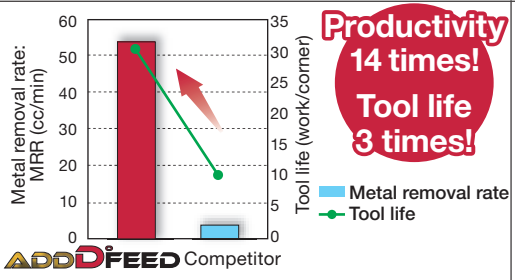
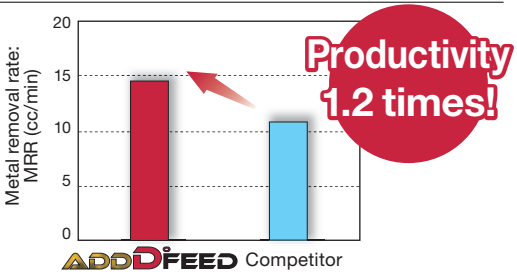


Designation	DCONWS	LSC	LSCN	BD	LF	LPR	LH	BD2	BD3	WT (kg)	G
BT40-RSG 8-105-M 25	8.5	18	6.5	15	105	25	80	30	32	1.4	M8
BT40-RSG 8-135-M 25	8.5	18	6.5	15	135	25	110	30	32	1.8	M8
BT40-RSG 8-130-M 50	8.5	18	6.5	15	130	50	80	30	32	1.4	M8
BT40-RSG 8-160-M 50	8.5	18	6.5	15	160	50	110	30	32	1.8	M8
BT40-RSG 8-155-M 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		EXN02R010M10.0-02 (ø10 mm, z = 2)	EXN02R012M12.0-02 (ø12 mm, z = 2)
Insert		LNMU0202ZER-MM	LNMU0202ZER-MM
Grade		AH3225	AH130
Workpiece material		SNCM439 (42HRC)	SUH660
		 P	 M
Cutting conditions	Cutting speed :*Vc* (m/min)	180	60
	Feed per tooth :*fz* (mm/t)	0.6	0.5
	Depth of cut :*ap* (mm)	0.4	0.3
	Width of cut :*ae* (mm)	10	8
	Process	Slotting	Shoulder milling
	Coolant	Wet	Wet
	Machine	Vertical M/C, BT30	Vertical M/C, BT50
Results			
		AddDoFeed eliminated chatter despite high cutting speed thanks to low cutting force, gaining productivity by 1.2 times.	AddDoFeed's small depth of cut, but much faster feed improved productivity by 1.2 times.

Workpiece type		Flange	Die and mold
Cutter		EXN02R025M25.0-07 (ø25 mm, z = 7)	EXN02R012M12.0-02 (ø12 mm, z = 2)
Insert		LNMU0202ZER-MM	LNMU0202ZER-MM
Grade		AH8015	AH8015
Workpiece material		SUS347	SNCM439 (42HRC)
		 M	 H
Cutting conditions	Cutting speed :*Vc* (m/min)	220	151
	Feed per tooth :*fz* (mm/t)	0.2	0.3
	Depth of cut :*ap* (mm)	0.5	0.5
	Width of cut :*ae* (mm)	25	- 12
	Process	Hole enlarging	Pocketing
	Coolant	Wet	Wet
	Machine	Vertical M/C, BT50	Vertical M/C, BT50
Results			
		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.	High wear resistant grade AH8015 has eliminated rapid insert wear during hardened steel machining, providing 1.2 times productivity by increasing cutting speed.

MEMO

MEMO

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