MillLine

DOFEED

www.tungaloy.com

Tungaloy Report No. 403-G

Innovative high-feed cutters offer **incredible productivity!**

Member IMC Group Tungaloy

ACCELERATED MACHINING

MillLine

DOFEED

TUNGALOY

TUNG FORCE MILL

ACCELERATED MACHINING

High-feed cutters reduce machining time **for a wide range of applications.**

Innovative high-feed cutters!

DoFeed offers outstanding productivity with close-pitch cutters and special insert geometry that reduces cutting force. The rich lineup of items meets a wide variety of application needs.

Outstanding productivity

Excellent chip evacuation prevents chip packing

- Air hole removes all chips away from the insert and cutter body.
- Large inclination forms ideal chips and controls the direction chips flow.

DOFEED **Good**
Curl consistently at ideal length

Competitor Poor
Crushed or unstable

Cutter	: TXN06R050M22.0E05
Insert	: LNMU06X5ZER-MJ
Grade	: AH725
Workpiece material	: Carbon steels (S55C / C55)
Cutting speed	: *Vc* =180 m/min
Feed per tooth	: *fz* = 1.8 mm/t
Depth of cut	: *ap* =1.0 mm
Coolant	: Dry
Machine	: Vertical M/C, BT50

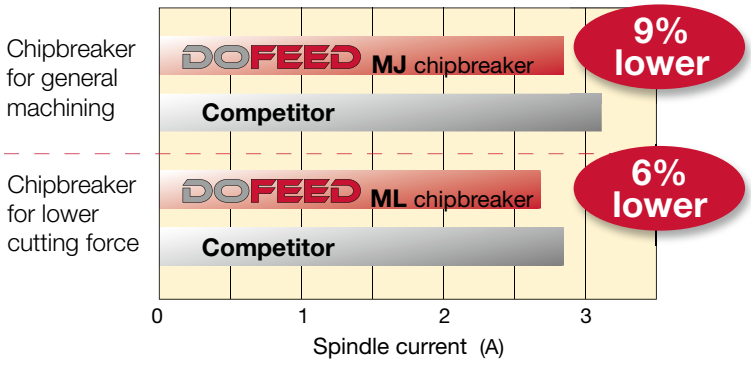
Close pitch cutters for high productivity!

Tool dia. øDc (mm)	No. of inserts (z)			Productivity improvement compared to competitor
	DOFEED		Competitor	
	Coarse pitch	Close pitch		
ø20	3	4	3	**1.3** times
ø25	4	5	4	**1.3** times
ø50	4	5	4	**1.3** times
ø63	4	6	4	**1.5** times

· ø20 and ø25 are based on EXN03 and HXN03 type
· ø50 and ø63 are based on TXN06 type

Reduced chatter due to double-sided insert with low cutting forces

Comparison of spindle load

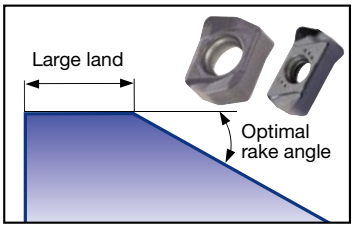


Cutter	: EXN03R025M25.0-05 (ø25, z = 5)
Insert	: LNMU0303ZER-MJ / ML
Grade	: AH725
Workpiece material	: Carbon steels (S55C / C55)
Cutting speed	: *Vc* = 250 (m/min)
Feed per tooth	: *fz* = 0.5 mm/t (1 insert)
Depth of cut	: *ap* = 0.5 mm
Width of cut	: *ae* = 25 mm (Slot milling)
Coolant	: Dry
Machine	: Vertical M/C, BT40

Extensive application coverage with a large variety of items

Three chipbreakers for all machining needs

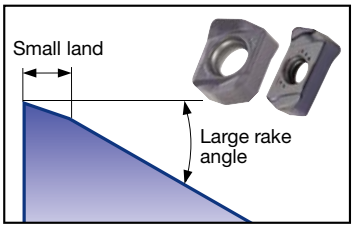
MJ General machining



P M K S H
Steel Stainless Cast iron Superalloys Hard Materials

4 cutting edges
· Excellent combination of sharpness and strength
· Ideal for machining steel, cast iron, and hardened steel

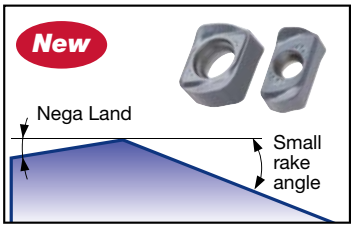
ML Low cutting force



P M S
Steel Stainless Superalloys

4 cutting edges
· Exceptional sharpness
· Suitable for cutting stainless steel, titanium alloys, and other exotic materials
· Reduces chattering when cutting with low rigid set-ups

MH Robust cutting edges



H
Hard Materials

4 cutting edges
· Robust cutting edges
· Suitable for hardened steel

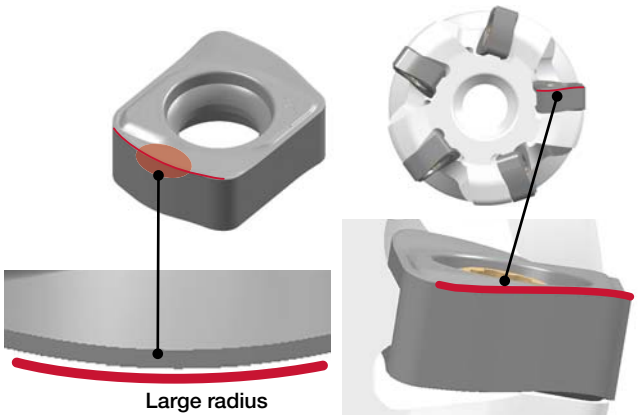
W Wiper insert

P M K S H
Steel Stainless Cast iron Superalloys Hard Materials

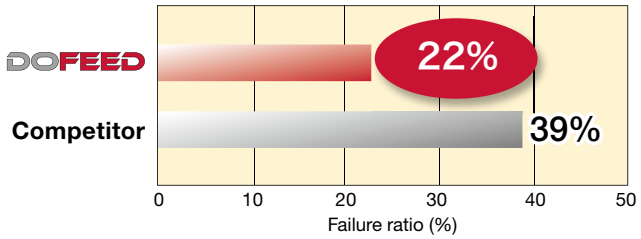
2 cutting edges
· Excellent surface finish while maintaining high productivity

MH chipbreaker features:

- Robust cutting edge design
- Large radius on the wiper edge
- Modest inclination angle of the cutting edge decreases the impact to the cutter when entering the workpiece, reducing premature insert failures and extending tool life.



Insert failure ratio is significantly reduced, improving tool life stability!

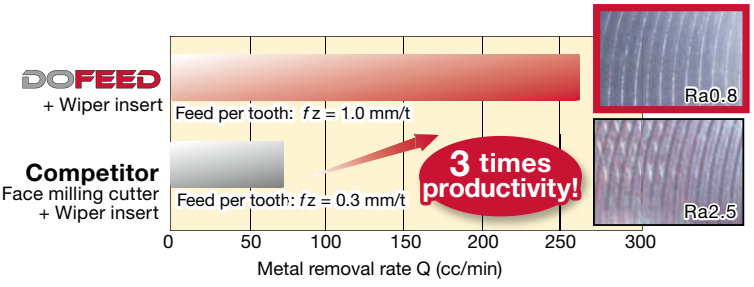


Cutter	: EXN03R032M32.0-06
Insert	: LNGU0303ZER-MH
Grade	: AH8015
Workpiece material	: SKD11 (45HRC)
Cutting speed	: *Vc* = 150 m/min
Feed per tooth	: *fz* = 0.4 mm/t
Depth of cut	: *ap* = 0.5 mm
Width of cut	: *ae* = ~ 32 mm
Coolant	: Dry
Machine	: Vertical M/C, BT50

Performance of wiper insert

Superb surface quality is achieved by high-feed motion

Remal removal rate comparison: DoFeed+wiper inserts vs aface mill cutter with wiper inserts



Wiper insert
LNGU06X5ZER-W

Cutter	: TXN06R080M31.7-05
Insert	: LNMU06X5ZER-ML x 3
	: LNGU06X5ZER-W x 2
Grade	: AH725
Workpiece material	: S55C
Cutting speed	: *Vc* = 150 m/min
Depth of cut	: *ap* = 1.5 mm
Width of cut	: *ae* = 60 mm
Coolant	: Dry
Machine	: Vertical M/C, BT50

DOFEED
TUNGALOY

Grades with long tool life for a wide range of materials

AH3035

P Steel M Stainless

- Wear and fracture resistant for high-feed application
- Most suitable for steel and stainless steel machining

AH725

P Steel K Cast iron S Superalloys H Hard Materials

- Superior resistance to wear and fracture in cast iron milling

AH130

S Superalloys M Stainless

- High chipping resistance
- Ideal for titanium alloy machining

AH120

K Cast iron

- Exceptionally wear resistant in cast iron machining

New

AH8015

H Hard Materials P Steel K Cast iron

- High wear and chipping resistance and minimized build-up edge due to nano multi-layered AlTiN coating with high Al content
- Well-suited for difficult materials of 45-55 HRc

New

AH8005

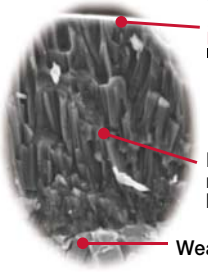
H Hard Materials

- High wear and chipping resistance and minimized build-up edge due to nano multi-layered AlTiN coating with high Al content
- Ideal for hardened steel of 55HRc and above

AH8000 SERIES
TUNGALOY

Special Surface Technology

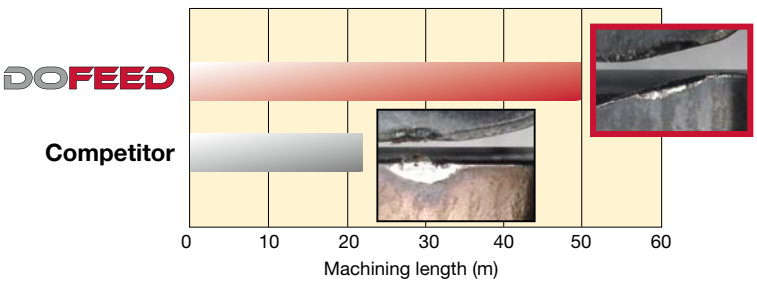
PREMIUMTEC
TUNGALOY



Smooth insert surface prevents chip adhesion!

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

Wear resistant substrate



Cutter	: EXN03R020M20.0-04
Insert	: LNGU0303ZER-MH
Grade	: AH8015
Workpiece material	: SKD61/X40CrMoV5-1(50HRC)
Cutting speed	: *Vc* = 150 m/min
Feed per tooth	: *fz* = 0.5 mm/t
Depth of cut	: *ap* = 0.5 mm
Width of cut	: *ae* = 10 mm
Coolant	: Dry
Machine	: Vertical M/C, BT40

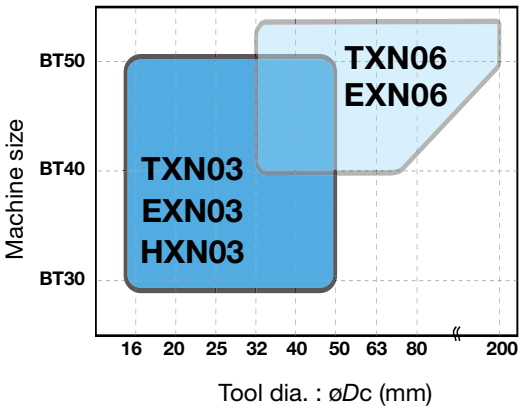
Specification of AH8015

Application	Grade	Substrate			Coating layer		Features
	Application code	Relative density	Hardness (HRA)	T.R.S. (GPa)	Main Composition	Thickness (μm)	
H Hard Materials P Steel K Cast iron	**AH8015**	15.0	92.0	3.0	Flash-Coating (Ti, Al)N, base	3.5	Superior wear resistance and eliminates build up edge
	H10-H20						
H Hard Materials	**AH8005**	15.0	93.0	2.0			
	H05-H15						

Rich lineup of cutter bodies from ø16 to ø200 mm

Insert	Bore type	Shank type	Modular type
LN*U03  Max. *ap* = 1.0 mm	**TXN03** (ø*D*c = 40 - 50 mm) 	**EXN03** (ø*D*c = 16 - 35 mm) 	**HXN03** (ø*D*c = 16 - 32 mm) 
LN*U06  Max. *ap* = 1.5 mm	**TXN06** (ø*D*c = 50 - 200 mm) 	**EXN06** (ø*D*c = 32 - 40 mm) 	

Applicable area

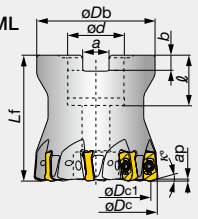


TXN03

Super high feed milling cutters with double sided inserts with 4 edges

A.R. = +6°, R.R. = +12° ~ 13°

With LNMU03-MJ/ML



With LNGU03-MH

Designation	Max. *ap*	ø*D*c	z	ø*D*c1	ø*D*c2	ø*D*b	ød	ℓ	*L*f	*b*	*a*	κ°	Kg	Air hole	Insert
TXN03R040M16.0E05	1	40	5	33.6	33.6	35	16	18	40	5.6	8.4	17	0.2	with	LN*U03...
TXN03R040M16.0E06	1	40	6	33.6	33.6	35	16	18	40	5.6	8.4	17	0.2	with	LN*U03...
TXN03R050M22.0E05	1	50	5	43.6	43.6	47	22	20	50	6.3	10.4	17	0.5	with	LN*U03...
TXN03R050M22.0E08	1	50	8	43.6	43.6	47	22	20	50	6.3	10.4	17	0.5	with	LN*U03...
TXN03R050M22.2-08	1	50	8	43.6	43.6	47	22.225	20	50	5	8	17	0.5	with	LN*U03...

SPARE PARTS

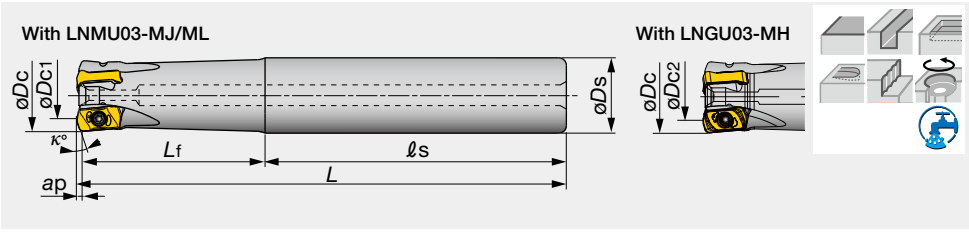



Designation	Clamping screw	Lubricant	Shell locking bolt	Wrench
TXN03R04...	CSPB-2.5	M-1000	CM8X30H	IP-8D
TXN03R05...	CSPB-2.5	M-1000	CM10X30H	IP-8D

EXN03

Super high feed milling endmills with double sided inserts with 4 edges

A.R. = +6°, R.R. = +5° ~ +11°



Designation	Max. ap	øDc	z	øDc1	øDc2	øDs	L	Lf	ℓs	κ°	Kg	Air hole	Insert
EXN03R016M16.0-02	1	16	2	9.6	9.8	16	100	30	70	15	0.2	with	LN*U03...
EXN03R016M16.0-02L	1	16	2	9.6	9.8	16	150	50	100	15	0.2	with	LN*U03...
EXN03R018M16.0-02	1	18	2	11.5	11.7	16	100	30	70	17	0.2	with	LN*U03...
EXN03R018M16.0-02L	1	18	2	11.5	11.7	16	150	25	125	17	0.2	with	LN*U03...
EXN03R020M20.0-03	1	20	3	13.5	13.6	20	130	50	80	17	0.3	with	LN*U03...
EXN03R020M20.0-03L	1	20	3	13.5	13.6	20	160	80	80	17	0.3	with	LN*U03...
EXN03R020M20.0-04	1	20	4	13.5	13.6	20	130	50	80	17	0.3	with	LN*U03...
EXN03R022M20.0-03	1	22	3	15.5	15.6	20	130	50	80	17	0.3	with	LN*U03...
EXN03R022M20.0-03L	1	22	3	15.5	15.6	20	160	30	130	17	0.4	with	LN*U03...
EXN03R022M20.0-04	1	22	4	15.5	15.6	20	130	50	80	17	0.3	with	LN*U03...
EXN03R025M25.0-04	1	25	4	18.5	18.6	25	140	60	80	17	0.5	with	LN*U03...
EXN03R025M25.0-04L	1	25	4	18.5	18.6	25	180	100	80	17	0.6	with	LN*U03...
EXN03R025M25.0-05	1	25	5	18.5	18.6	25	140	60	80	17	0.5	with	LN*U03...
EXN03R028M25.0-04	1	28	4	21.5	21.6	25	140	60	80	17	0.5	with	LN*U03...
EXN03R028M25.0-04L	1	28	4	21.5	21.6	25	180	35	145	17	0.7	with	LN*U03...
EXN03R028M25.0-05	1	28	5	21.5	21.6	25	140	60	80	17	0.5	with	LN*U03...
EXN03R030M32.0-04	1	30	4	23.5	23.6	32	150	70	80	17	0.8	with	LN*U03...
EXN03R030M32.0-04L	1	30	4	23.5	23.6	32	200	120	80	17	0.9	with	LN*U03...
EXN03R030M32.0-05	1	30	5	23.5	23.6	32	150	70	80	17	0.8	with	LN*U03...
EXN03R032M32.0-05	1	32	5	25.5	25.6	32	150	70	80	17	0.8	with	LN*U03...
EXN03R032M32.0-05L	1	32	5	25.5	25.6	32	200	120	80	17	1.1	with	LN*U03...
EXN03R032M32.0-06	1	32	6	25.5	25.6	32	150	70	80	17	0.9	with	LN*U03...
EXN03R035M32.0-05	1	35	5	28.5	28.6	32	150	35	115	17	0.9	with	LN*U03...
EXN03R035M32.0-05L	1	35	5	28.5	28.6	32	200	35	165	17	1.2	with	LN*U03...
EXN03R035M32.0-06	1	35	6	28.5	28.6	32	150	35	115	17	0.9	with	LN*U03...

SPARE PARTS



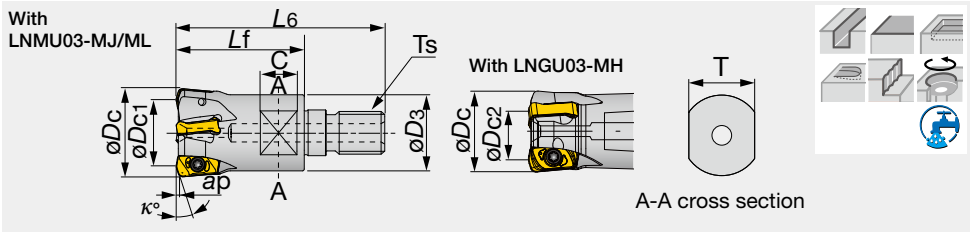
Designation	Clamping screw	Lubricant	Wrench
EXN03...	CSPB-2.5	M-1000	IP-8D

TUNGFLEX

HXN03-M

Super high feed milling endmills (Dofeed) with TungFlex

A.R. = +6°, R.R. = +5° ~ +11°



Designation	Max. ap	øDc	z	øDc1	øDc2	L6	Lf	C	T	øD3	κ°	Ts	Kg	Air hole	Insert
HXN03R016MM08-02	1	16	2	9.6	9.8	42	25	8	10	12.8	15	M8	0.03	with	LN*U03...
HXN03R018MM08-02	1	18	2	11.5	11.7	42	25	8	10	14.5	17	M8	0.04	with	LN*U03...
HXN03R020MM10-03	1	20	3	13.5	13.6	49	30	10	15	17.8	17	M10	0.06	with	LN*U03...
HXN03R020MM10-04	1	20	4	13.5	13.6	49	30	10	15	17.8	17	M10	0.06	with	LN*U03...
HXN03R022MM10-03	1	22	3	15.5	15.6	49	30	10	15	17.8	17	M10	0.06	with	LN*U03...
HXN03R022MM10-04	1	22	4	15.5	15.6	49	30	10	15	17.8	17	M10	0.07	with	LN*U03...
HXN03R025MM12-04	1	25	4	18.5	18.6	57	35	10	17	20.8	17	M12	0.1	with	LN*U03...
HXN03R025MM12-05	1	25	5	18.5	18.6	57	35	10	17	20.8	17	M12	0.11	with	LN*U03...
HXN03R028MM12-04	1	28	4	21.5	21.6	57	35	10	17	23	17	M12	0.12	with	LN*U03...
HXN03R028MM12-05	1	28	5	21.5	21.6	57	35	10	17	23	17	M12	0.12	with	LN*U03...
HXN03R030MM16-04	1	30	4	23.5	23.6	63	40	12	22	28.8	17	M16	0.19	with	LN*U03...
HXN03R030MM16-05	1	30	5	23.5	23.6	63	40	12	22	28.8	17	M16	0.2	with	LN*U03...
HXN03R032MM16-05	1	32	5	25.5	25.6	63	40	12	22	28.8	17	M16	0.2	with	LN*U03...
HXN03R032MM16-06	1	32	6	25.5	25.6	63	40	12	22	28.8	17	M16	0.21	with	LN*U03...

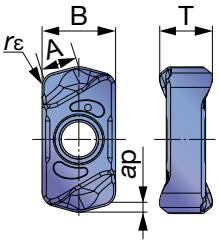
SPARE PARTS



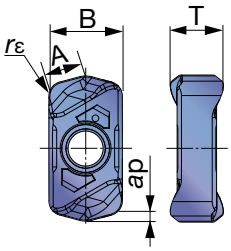
Designation	Clamping screw	Lubricant	Wrench
HXN03...	CSPB-2.5	M-1000	IP-8D

INSERT

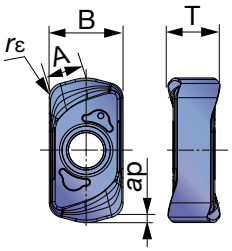
LNMU03-MJ (for general purpose)

LNMU03-ML (for low cutting force)

LNGU03-MH (Robust cutting edges)

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

★ : First choice
☆ : Second choice

Designation	rε	Max. ap	Coated New AH130	AH725	AH3035	AH8015	AH8005	A	B	T
LNMU0303ZER-MJ	1.2	1	●	●	●	●		3.2	6	4.3
LNMU0303ZER-ML	1.2	1	●	●	●	●		3.2	6	4.3
New LNGU0303ZER-MH	1.2	1				●	●	3.2	6	4.3

●: Line up

TXN06

Super high feed milling cutters with double sided inserts with 4 edges

A.R.=+10°,R.R.=+2°~+6°

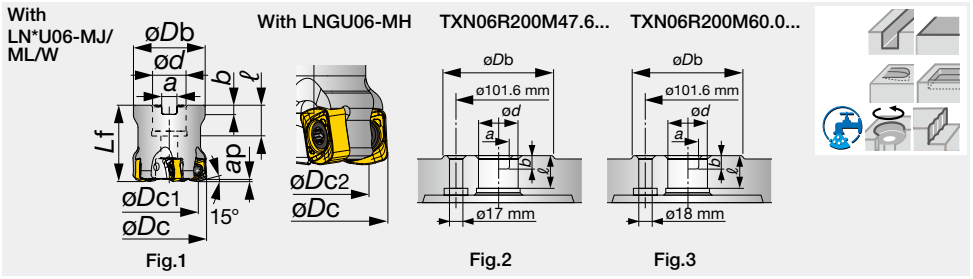


Fig.1 Fig.2 Fig.3

Designation	Max. *ap*	*øDc*	z	*øDc1*	*øDc2*	*øDb*	*Lf*	*ød*	*ℓ*	*a*	*b*	Kg	Air hole	Insert	Fig.
TXN06R050M22.0E04	1.5	50	4	37.6	36.9	47	50	22	20	10.4	6.3	0.4	with	LN*U06...	1
TXN06R050M22.0E05	1.5	50	5	37.6	36.9	47	50	22	20	10.4	6.3	0.4	with	LN*U06...	1
TXN06R050M22.2-04	1.5	50	4	37.6	36.9	47	50	22.225	20	8	5	0.4	with	LN*U06...	1
TXN06R050M22.2-05	1.5	50	5	37.6	36.9	47	50	22.225	20	8	5	0.4	with	LN*U06...	1
TXN06R052M22.0E04	1.5	52	4	39.6	38.9	49	50	22	20	10.4	6.3	0.5	with	LN*U06...	1
TXN06R052M22.0E05	1.5	52	5	39.6	38.9	49	50	22	20	10.4	6.3	0.5	with	LN*U06...	1
TXN06R063M22.0E04	1.5	63	4	50.6	49.8	59	50	22	20	10.4	6.3	0.8	with	LN*U06...	1
TXN06R063M22.0E06	1.5	63	6	50.6	49.8	59	50	22	20	10.4	6.3	0.8	with	LN*U06...	1
TXN06R063M22.2-04	1.5	63	4	50.6	49.8	59	50	22.225	20	8	5	0.8	with	LN*U06...	1
TXN06R063M22.2-06	1.5	63	6	50.6	49.8	59	50	22.225	20	8	5	0.8	with	LN*U06...	1
TXN06R066M27.0E04	1.5	66	4	53.6	52.8	63	50	27	22	12.4	7	0.8	with	LN*U06...	1
TXN06R066M27.0E06	1.5	66	6	53.6	52.8	63	50	27	22	12.4	7	0.8	with	LN*U06...	1
TXN06R080M27.0E05	1.5	80	5	67.6	66.8	76	63	27	22	12.4	7	1.6	with	LN*U06...	1
TXN06R080M27.0E08	1.5	80	8	67.6	66.8	76	63	27	22	12.4	7	1.6	with	LN*U06...	1
TXN06R080M31.7-05	1.5	80	5	67.6	66.8	76	63	31.75	32	12.7	8	1.6	with	LN*U06...	1
TXN06R080M31.7-08	1.5	80	8	67.6	66.8	76	63	31.75	32	12.7	8	1.6	with	LN*U06...	1
TXN06R100M31.7-06	1.5	100	6	87.6	86.8	96	63	31.75	32	12.7	8	2.2	with	LN*U06...	1
TXN06R100M32.0E06	1.5	100	6	87.6	86.8	96	63	32	25	14.4	8	2.2	with	LN*U06...	1
TXN06R125M38.1-08	1.5	125	8	112.6	111.8	100	63	38.1	43	15.9	10	3	with	LN*U06...	1
TXN06R125M40.0E08	1.5	125	8	112.6	111.8	100	63	40	37	16.4	9	3	with	LN*U06...	1
TXN06R160M40.0E10	1.5	160	10	147.6	146.8	100	63	40	37	16.4	9	5	with	LN*U06...	1
TXN06R160M50.8-10	1.5	160	10	147.6	146.8	100	63	50.8	46	19	11	4.6	with	LN*U06...	1
TXN06R200M47.6-12	1.5	200	12	187.6	186.8	130	63	47.625	38	25.4	14	7.7	without	LN*U06...	2
TXN06R200M60.0E12	1.5	200	12	187.6	186.8	130	63	60	38	25.7	14	7.2	without	LN*U06...	3

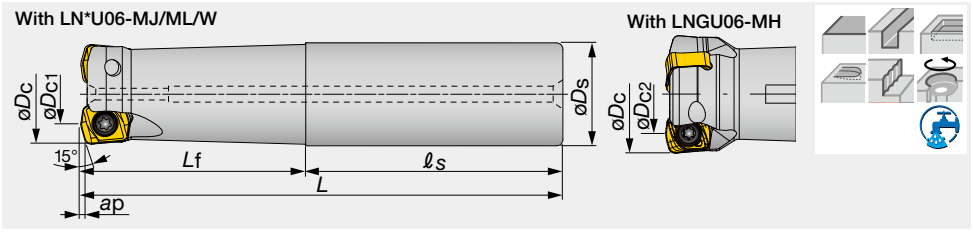
SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Shell locking bolt	Shell locking bolt 1	Torx bit
TXN06R050M22.0...	CSPB-5	H-TB2W	M-1000	-	FSHM10-40H	BLDIP20/S7
TXN06R050M22.2-04	CSPB-5	H-TB2W	M-1000	-	CM10-30H	BLDIP20/S7
TXN06R050M22.2-05, TXN06R052M22.0...	CSPB-5	H-TB2W	M-1000	-	FSHM10-40H	BLDIP20/S7
TXN06R063M...	CSPB-5	H-TB2W	M-1000	-	CM10X30H	BLDIP20/S7
TXN06R066,080M27.0...	CSPB-5	H-TB2W	M-1000	-	CM12X30H	BLDIP20/S7
TXN06R080,100M31.7...	CSPB-5	H-TB2W	M-1000	-	CM16X40H	BLDIP20/S7
TXN06R125M...	CSPB-5	H-TB2W	M-1000	TMBA-M20H	-	BLDIP20/S7
TXN06R160M40.0...	CSPB-5	H-TB2W	M-1000	TMBA-M20H	-	BLDIP20/M7
TXN06R160M50.8...	CSPB-5	H-TB2W	M-1000	TMBA-M24H	-	BLDIP20/M7
TXN06R200M...	CSPB-5	H-TB2W	M-1000	-	-	BLDIP20/M7

EXN06

Super high feed milling endmills with double sided inserts with 4 edges

A.R.=+10°,R.R.= -2°~+6°



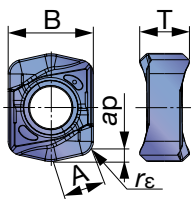
Designation	Max. *ap*	øD_c	z	øD_{c1}	øD_{c2}	øD_s	*L*	L_f	ℓ_s	Kg	Air hole	Insert
EXN06R032M32.0-02	1.5	32	2	19.7	19.1	32	150	70	80	0.8	with	LN*U06...
EXN06R032M32.0-02L	1.5	32	2	19.7	19.1	32	200	120	80	1.1	with	LN*U06...
EXN06R035M32.0-02	1.5	35	2	22.7	22	32	150	45	105	0.9	with	LN*U06...
EXN06R035M32.0-02L	1.5	35	2	22.7	22	32	200	45	155	1.2	with	LN*U06...
EXN06R040M32.0-03	1.5	40	3	27.7	27	32	150	45	105	0.9	with	LN*U06...
EXN06R040M32.0-03L	1.5	40	3	27.7	27	32	220	45	175	1.3	with	LN*U06...

SPARE PARTS

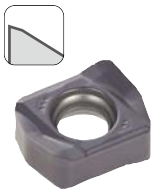
Designation	Clamping screw	Lubricant	Wrench
EXN06	CSPB-5	M-1000	IP-20D

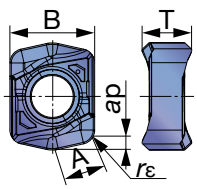
INSERT

LNMU06-MJ

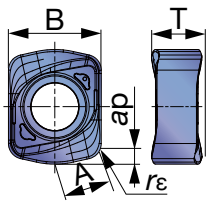


LNMU06-ML

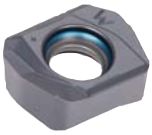


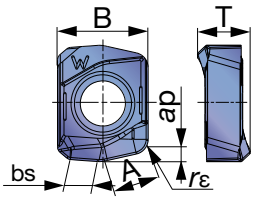


LNGU06-MH



LNGU06-W (2 cutting edges)





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

★ : First choice
☆ : Second choice

Designation	rε	Max. ap	Coated					New	A	B	T	bs
			AH120	AH130	AH725	AH3035	AH8015	AH8005				
LNMU06X5ZER-MJ	2	1.5	●	●	●	●	●		6	12	7	-
LNMU06X5ZER-ML	2	1.5	●	●	●	●	●		6	12	7	-
New LNGU06X5ZER-MH	2	1.5					●	●	6	12	7	-
LNGU06X5ZER-W	2	1.5			●				6	12	7	3.6

●: Line up

DOFEED TUNGALOY

Standard cutting conditions TXN03 / EXN03 / HXN03 type

ISO	Workpiece material	Hardness	Priority	Grade	Chip-breaker	Cutting speed *Vc* (m/min)	Feed per tooth: *fz* (mm/t) Tool dia.: ø*Dc* (mm) ø16 ~ ø22	ø25 ~ ø50	Plunging	ø16, z = 2 *n*	ø16, z = 2 *Vf*	ø18, z = 2 *n*	ø18, z = 2 *Vf*	ø20 *n*	ø20 *Vf* z = 3	ø20 *Vf* z = 4
P	Carbon steels (C45, C55, etc.)	~ 300HB	First choice	AH3035	MJ	100 - 300	0.5 -1.2	0.5 - 1.5	0.1	3,980	6,370	3,540	5,660	3,180	7,630	10,180
			for wear resistance	AH8015	MJ					*Vc* = 200 m/min, *fz* = 0.8 mm/t						
	Alloy steels (42CrMo4, 17Cr3, etc.)	~ 300HB	First choice	AH3035	MJ	100 - 300	0.5 -1.2	0.5 - 1.5	0.1	3,980	6,370	3,540	5,660	3,180	7,630	10,180
			for wear resistance	AH8015	MJ					*Vc* = 200 m/min, *fz* = 0.8 mm/t						
	Prehardened steels (NAK80, PX5, etc.)	30 ~ 40HRC	First choice	AH3035	ML	100 - 200	0.5 - 1.0	0.5 - 1.0	0.1	2,980	4,170	2,650	3,710	2,390	5,020	6,690
		30 ~ 40HRC	for impact resistance	AH3035	MJ	100 - 200	0.5 - 1.2	0.5 - 1.5	0.1	2,980	4,770	2,650	4,240	2,390	5,740	7,650
		30 ~ 40HRC	for wear resistance	AH8015	ML	100 - 200	0.5 - 1.0	0.5 - 1.0	0.1	2,980	4,170	2,650	3,710	2,390	5,020	6,690
										Vc = 150 m/min, *fz* = 0.7 mm/t						
										Vc = 150 m/min, *fz* = 0.8 mm/t						
M	Stainless steels (X5CrNi18-10, X5CrNiMo17-12-2, etc.)	~ 200HB	First choice	AH3035	ML	100 - 150	0.3 - 0.8	0.3 - 0.8	0.08	2,390	2,390	2,120	2,120	1,910	2,870	3,820
			for impact resistance	AH3035	MJ					*Vc* = 120 m/min, *fz* = 0.5 mm/t						
K	Gray cast irons (GG25, GG30, etc.)	150 ~ 250HB	First choice	AH725	MJ	100 - 300	0.5 - 1.2	0.5 - 1.5	0.1	3,980	6,370	3,540	5,660	3,180	7,630	10,180
										Vc = 200 m/min, *fz* = 0.8 mm/t						
		150 ~ 250HB	for wear resistance	AH8015	MJ	100 - 300	0.5 - 0.7	0.5 - 1.0	0.1	3,980	4,780	3,540	4,250	3,180	5,720	7,630
										Vc = 200 m/min, *fz* = 0.6 mm/t						
	Ductile cast irons (GGG40, etc.)	150 ~ 250HB	First choice	AH725	MJ	80 - 200	0.5 - 1.2	0.5 - 1.5	0.1	2,980	4,770	2,650	4,240	2,390	5,740	7,650
			for wear resistance	AH8015	MJ					*Vc* = 150 m/min, *fz* = 0.8 mm/t						
S	Titanium alloy (Ti-6Al-4V, etc.)	~ 40HRC	First choice	AH130	ML	30 - 60	0.3 - 0.7	0.3 - 0.7	0.08	800	640	710	570	640	770	1,020
			for impact resistance	AH130	MJ					*Vc* = 40 m/min, *fz* = 0.4 mm/t						
	Heat-resistance alloy (Inconel, Hasteroy, etc.)	~ 40HRC	First choice	AH725	ML	20 - 50	0.1 - 0.3	0.1 - 0.3	0.05	600	240	530	210	480	290	380
			for impact resistance	AH725	MJ					*Vc* = 30 m/min, *fz* = 0.2 mm/t						
H	Hot mold steel (X40CrMoV5-1, etc.)	40 ~ 55HRC	First choice	AH8015	MH	80 - 150	0.1 - 0.5	0.1 - 0.5	0.05	2,390	1,430	2,120	1,270	1,910	1,720	2,290
			for wear resistance	AH8015	MJ					*Vc* = 120 m/min, *fz* = 0.3 mm/t						
	Hot mold steel of D.T.C materials (DAC**, DH**, DIEVER, etc)	40 ~ 55HRC	First choice	AH8015	MJ	50-100	0.1 - 0.3	0.1 - 0.3	0.05	1,590	640	1,420	570	1,270	760	1,020
			for impact resistance	AH8015	MH					*Vc* = 80 m/min, *fz* = 0.2mm/t						
	Cold mold steel (X153CrMoV12, etc.)	55~ 60HRC	First choice	AH8005	MH	50 - 70	0.05 - 0.2	0.03 - 0.1	0.03	1,190	290	1,060	250	950	340	450
										Vc = 60 m/min, *fz* = 0.12 mm/t						
		55 ~ 60HRC	for impact resistance	AH8015	MH	50 - 70	0.03 - 0.1	0.05 - 0.2	0.03	1,190	150	1,060	130	950	170	230
										Vc = 60 m/min, *fz* = 0.06 mm/t						

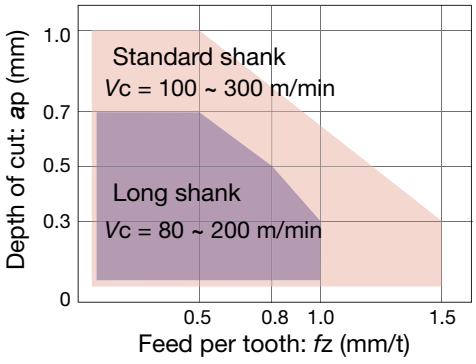
· When chips stay in the cutting zone during slotting or pocketing, use air blast to remove chips from the work area.

· Tool overhang length must be as short as possible to avoid chatter. When the tool overhang length is long, decrease the number of revolutions and feed.

Cautionary points in use

The use of a standard or long shank

When using a long shank, please lower the cutting conditions (*Vc*, *fz*, *ap*) to 70% of the maximum conditions for the standard shank.

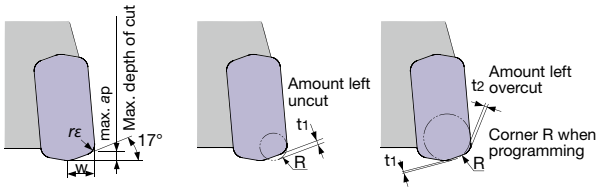


Tool dia.: ø*Dc* = ø16 ~ 35 mm
Workpeice: S55C / C55 (200HB)

L/D ratio of overhang
Standard shank: L/D ≤ 3
Long shank: L/D = 4

Tool geometry on programming

When programming for CAM, the tool should be considered as a radius cutter. Usually, the corner radius should be set as R = 1.5 mm. If a larger radius is used, overcutting will occur. The following table shows the amount left uncut (t_1) and overcut (t_2).



LNMU03-MJ/ML

Max. depth of cut max ap (mm)	Corner radius r_ε (mm)	W (mm)	Corner R when program-ming	Amount left uncut t^1 (mm)	Amount left overcut t^2 (mm)
1.0	1.2	3.0	1.0	0.6	-
1.0	1.2	3.0	1.5	0.5	-
1.0	1.2	3.0	2.0	0.25	0.08
1.0	1.2	3.0	2.5	0.14	0.26

LNGU03-MH

Max. depth of cut max ap (mm)	Corner radius r_ε (mm)	W (mm)	Corner R when program-ming	Amount left uncut t^1 (mm)	Amount left overcut t^2 (mm)
1.0	1.2	3.0	1.0	0.45	-
1.0	1.2	3.0	1.5	0.35	-
1.0	1.2	3.0	2.0	0.2	0.1
1.0	1.2	3.0	2.5	0.08	0.29

Each value in table is calculated theoretically at the maximum condition.

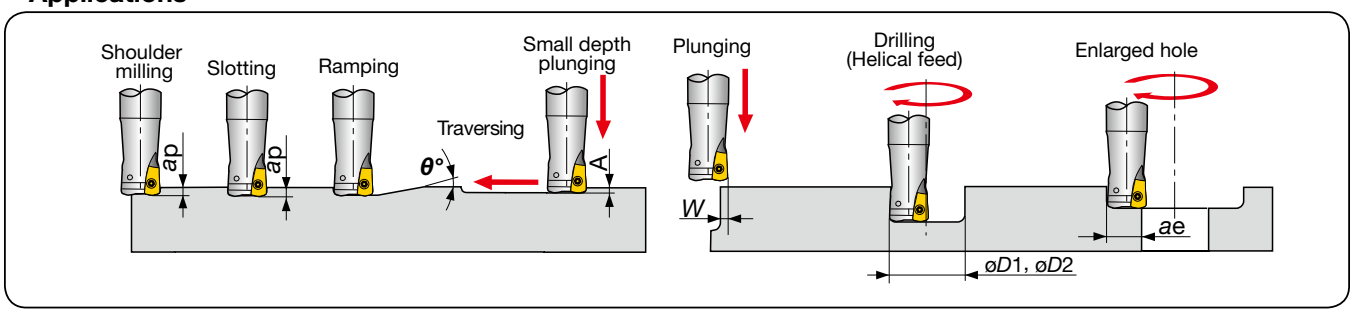
Tool dia.: øDc (mm), Number of revolutions: *n* (min⁻¹), Feed speed: *Vf* (mm/min), Max. depth of cut: *ap* = 1.0 mm

ø22			ø25			ø28			ø30			ø32			ø35			ø40			ø50		
n	*Vf*		*n*	*Vf*		*n*	*Vf*		*n*	*Vf*		*n*	*Vf*		*n*	*Vf*		*n*	*Vf*		*n*	*Vf*	
	z = 3	z = 4		z = 4	z = 5		z = 4	z = 5		z = 4	z = 5		z = 5	z = 6		z = 5	z = 6		z = 5	z = 6		z = 5	z = 8
2,890	6,940	9,250	2,550	8,160	10,180	2,270	7,280	9,100	2,120	8,480	10,600	1,990	9,950	11,940	1,820	9,100	10,920	1,590	7,950	9,540	1,270	6,350	10,160
Vc = 200 m/min, *fz* = 1.0 mm/t																							
2,890	6,940	9,250	2,550	8,160	10,180	2,270	7,280	9,100	2,120	8,480	10,600	1,990	9,950	11,940	1,820	9,100	10,920	1,590	7,950	9,540	1,270	6,350	10,160
Vc = 200 m/min, *fz* = 1.0 mm/t																							
2,170	4,560	6,080	1,910	5,350	6,690	1,710	4,790	5,990	1,590	4,450	5,570	1,490	5,220	6,260	1,360	4,760	5,710	1,190	4,170	5,000	950	3,330	5,320
Vc = 150 m/min, *fz* = 0.7 mm/t																							
2,170	5,210	6,940	1,910	7,640	9,550	1,710	6,840	8,550	1,590	6,360	7,950	1,490	7,450	8,940	1,360	6,800	8,160	1,190	5,950	7,140	950	4,750	7,600
Vc = 150 m/min, *fz* = 1.0 mm/t																							
2,170	4,560	6,080	1,910	5,350	6,690	1,710	4,790	5,990	1,590	4,450	5,570	1,490	5,220	6,260	1,360	4,760	5,710	1,190	4,170	5,000	950	3,330	5,320
Vc = 150 m/min, *fz* = 0.7 mm/t																							
1,740	2,610	3,480	1,530	3,060	3,820	1,360	2,730	3,410	1,270	3,050	3,810	1,190	3,570	4,280	1,090	3,270	3,920	950	2,850	3,420	760	2,280	3,650
Vc = 120 m/min, *fz* = 0.6 mm/t																							
2,890	6,940	9,250	2,550	8,160	10,180	2,270	7,280	9,100	2,120	8,480	10,600	1,990	9,950	11,940	1,820	9,100	10,920	1,590	7,950	9,540	1,270	6,350	10,160
Vc = 200 m/min, *fz* = 1.0 mm/t																							
2,890	5,200	6,940	2,550	6,110	7,640	2,270	5,460	6,820	2,120	6,780	8,480	1,990	7,960	9,550	1,820	7,280	8,740	1,590	6,360	7,630	1,270	5,080	8,130
Vc = 200 m/min, *fz* = 0.8 mm/t																							
2,170	5,210	6,940	1,910	6,110	7,640	1,710	5,460	6,820	1,590	6,360	7,950	1,490	7,450	8,940	1,360	6,800	8,160	1,190	5,950	7,140	950	4,750	5,700
Vc = 150 m/min, *fz* = 1.0 mm/t																							
580	700	930	510	820	1,020	450	730	910	420	840	1,050	400	1,000	1,200	360	900	1,080	320	800	960	250	630	1,000
Vc = 40 m/min, *fz* = 0.5 mm/t																							
430	260	340	380	230	290	340	200	260	320	260	320	300	300	360	270	270	320	240	240	290	190	190	300
Vc = 30 m/min, *fz* = 0.2 mm/t																							
1,740	1,570	2,090	1,530	1,840	2,300	1,360	1,630	2,040	1,270	1,520	1,910	1,190	1,790	2,140	1,090	1,640	1,960	950	1,430	1,710	760	1,140	1,820
Vc = 120 m/min, *fz* = 0.3 mm/t																							
1,160	700	930	1,020	820	1,020	910	730	910	850	680	850	800	800	960	730	730	880	640	640	770	510	510	820
Vc = 80 m/min, *fz* = 0.2mm/t																							
870	310	420	760	300	380	680	270	340	640	260	320	600	300	360	550	230	340	480	240	280	380	200	300
Vc = 60 m/min, *fz* = 0.1 mm/t																							
870	160	210	760	150	190	680	140	170	640	130	160	600	150	180	550	120	170	480	120	140	380	100	150
Vc = 60 m/min, *fz* = 0.06 mm/t																							

· The above table shows the conditions for standard shank type cutters. When using long shank type cutters, the number of teeth may be different. In this case, the cutting conditions should be changed by referring to: "The usage of standard and long shanks" shown in previous page.

· Cutting conditions are generally limited by the rigidity and power of the machine and the rigidity of the workpiece. When setting the conditions, start from half of the values of the standard cutting conditions and then increase the value gradually while making sure the machine is running normally.

Applications



Designation	Tool dia. øDc	Max. depth of cut Max *ap*	Max. ramping angle *θ*°		Max. plunging depth A	Max. cutting width in plunging *W*		Min.machinable hole dia. øD1		Max.machinable hole dia. øD2	Max. cutting width in enlarged hole *ae*
			MJ/ML	MH		MJ/ML	MH	MJ/ML	MH		
E/HXN03R016M...	ø16	1	2.1	1.7	0.3	3.5	3	22	23	30	12.5
E/HXN03R018M...	ø18	1	1.7	1.6	0.3	3.5	3	26	27	34	14.5
E/HXN03R020M...	ø20	1	1.4	1.3	0.3	3.5	3	30	31	38	16.5
E/HXN03R022M...	ø22	1	1.2	1.1	0.3	3.5	3	34	35	42	18.5
E/HXN03R025M...	ø25	1	1.0	0.9	0.3	3.5	3	40	41	48	21.5
E/HXN03R028M...	ø28	1	0.8	0.8	0.3	3.5	3	46	46	54	24.5
E/HXN03R030M...	ø30	1	0.7	0.7	0.3	3.5	3	50	50	58	26.5
E/HXN03R032M...	ø32	1	0.7	0.7	0.3	3.5	3	54	54	62	28.5
EXN03R035M...	ø35	1	0.6	0.6	0.3	3.5	3	60	60	68	31.5
TXN03R040M...	ø40	1	0.5	0.5	0.3	3.5	3	70	70	78	36.5
TXN03R050M...	ø50	1	0.4	0.4	0.3	3.5	3	90	90	98	46.5

· For øDc above ø33 mm, slot milling, ramping or contouring is not recommended as chips may be re-cut

DOFEED TUNGALOY

Standard cutting conditions TXN06 / EXN06 type

ISO	Work material	Hardness	Priority	Grades	Chip-breaker	Cutting speed *Vc* (m/min)	Feed per tooth *fz* (mm/t) Tool dia: *øDc* (mm) ø32 ~ ø200	Feed when plunging *fz* (mm/t)	ø32, z = 2 *n*	ø32, z = 2 *Vf*	ø35, z = 2 *n*	ø35, z = 2 *Vf*	ø40, z = 3 *n*	ø40, z = 3 *Vf*
P	Carbon steels (C45, C55, etc.)	~ 300HB	First choice	AH3035	MJ	100 - 300	0.5 - 1.5	0.15	1,990	3,980	1,820	3,640	1,590	4,770
			for wear resistance	AH8015	MJ				*Vc* = 200 m/min, *fz* = 1.0 mm/t					
	Alloy steels (42CrMo4, 17Cr3, etc.)	~ 300HB	First choice	AH3035	MJ	100 - 300	0.5 - 1.5	0.15	1,990	3,980	1,820	3,640	1,590	4,770
			for wear resistance	AH8015	MJ				*Vc* = 200 m/min, *fz* = 1.0 mm/t					
	Prehardened steels (NAK80, PX5, etc.)	30 ~ 40HRC	First choice	AH3035	ML	100 - 200	0.5 - 1.0	0.15	1,490	2,380	1,360	2,180	1,190	2,860
									Vc = 150 m/min, *fz* = 0.8 mm/t					
		30 ~ 40HRC	for impact resistance	AH3035	MJ	100 - 200	0.5 - 1.5	0.15	1,490	2,980	1,360	2,720	1,190	3,570
									Vc = 150 m/min, *fz* = 1.0 mm/t					
		30 ~ 40HRC	for wear resistance	AH8015	ML	100 - 200	0.5 - 1.0	0.15	1,490	2,380	1,360	2,180	1,190	2,860
									Vc = 150 m/min, *fz* = 0.8 mm/t					
M	Stainless steels (X5CrNi18-10, X5CrNiMo17-12-2, etc.)	~ 200HB	First choice	AH3035	ML	100 - 150	0.3 - 0.8	0.1	1,190	1,430	1,090	1,310	950	1,710
			for impact resistance	AH3035	MJ				*Vc* = 120 m/min, *fz* = 0.6 mm/t					
K	Gray cast irons (GG25, GG30, etc.)	150 ~ 250HB	First choice	AH120	MJ	100 - 300	0.5 - 1.5	0.15	1,990	3,980	1,820	3,640	1,590	4,770
			for wear resistance	AH8015	MJ				*Vc* = 200 m/min, *fz* = 1.0 mm/t					
		150 ~ 250HB	First choice	AH120	MJ	80 - 200	0.5 - 1.5	0.15	1,490	2,980	1,360	2,720	1,190	3,570
			for wear resistance	AH8015	MJ				*Vc* = 150 m/min, *fz* = 1.0 mm/t					
S	Titanium alloy (Ti-6Al-4V, etc.)	~ 40HRC	First choice	AH130	ML	30 - 60	0.3 - 0.7	0.08	400	400	360	360	320	480
			for impact resistance	AH130	MJ				*Vc* = 40 m/min, *fz* = 0.5 mm/t					
	Heat-resistance alloy (Inconel, Hasteroy, etc.)	~ 40HRC	First choice	AH725	ML	20 - 50	0.1 - 0.3	0.05	300	120	270	110	240	140
			for impact resistance	AH725	MJ				*Vc* = 30 m/min, *fz* = 0.2 mm/t					
H	Hot mold steel (X40CrMoV5-1, etc.)	40 ~ 55HRC	First choice	AH8015	MH	80 - 150	0.1 - 0.5	0.05	1,190	710	1,090	650	950	850
			for wear resistance	AH8015	MJ				*Vc* = 120 m/min, *fz* = 0.3mm/t					
	Hot mold steel of D.T.C materials (DAC**, DH**, DIEVER, etc)	40 ~ 55HRC	First choice	AH8015	MJ	50-100	0.1 - 0.3	0.05	800	320	730	290	640	380
			for impact resistance	AH8015	MH				*Vc* = 80 m/min, *fz* = 0.2mm/t					
	Cold mold steel (X153CrMoV12, etc.)	55 ~ 65HRC	First choice	AH8005	MH	50 - 70	0.05 - 0.2	0.03	600	120	550	110	480	140
									Vc = 60 m/min, *fz* = 0.1 mm/t					
		55 ~ 65HRC	for impact resistance	AH8015	MH	50 - 70	0.03 - 0.1	0.03	600	60	550	55	480	70
									Vc = 60 m/min, *fz* = 0.05 mm/t					

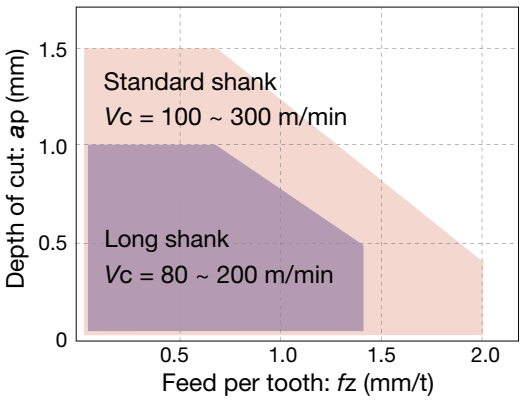
· The above table shows the conditions for standard shank type cutters. When using long shank type cutters, the number of teeth may be different. In this case, the cutting conditions should be changed by referring to: "The usage of standard and long shanks" shown in previous page.

· Cutting conditions are generally limited by the rigidity and power of the machine and the rigidity of the workpiece. When setting the conditions, start from half of the values of the standard cutting conditions and then increase the value gradually while making sure the machine is running normally.

Cautionary points in use

The use of a standard or long shank

When using a long shank, please lower the cutting conditions (*Vc*, *fz*, *ap*) to 70% of the maximum conditions for the standard shank.

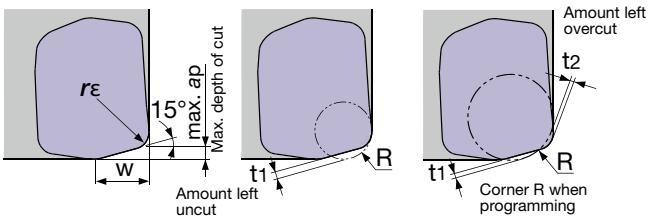


Tool dia.: *øDc* = ø32 ~ 40 mm
Workpiece: S55C / C55 (200HB)

L/D ratio of overhang
Standard shank: L/D ≤ 3
Long shank: L/D = 4

Tool geometry on programming

When programming for CAM, the tool should be considered as a radius cutter. Usually, the corner radius should be set as R = 3.0 mm. If a larger radius is used, overcutting will occur. The following table shows the amount left uncut (t_1) and overcut (t_2).



LNMU06-MJ/ML

Max. depth of cut max *ap* (mm)	Corner radius r_ε	W (mm)	Corner R when program-ming	Amount left uncut t^1 (mm)	Amount left overcut t^2 (mm)
1.5	2.0	6.0	2.0	1.0	-
			3.0	0.77	-
			4.0	0.54	0.26

LNGU06-MH

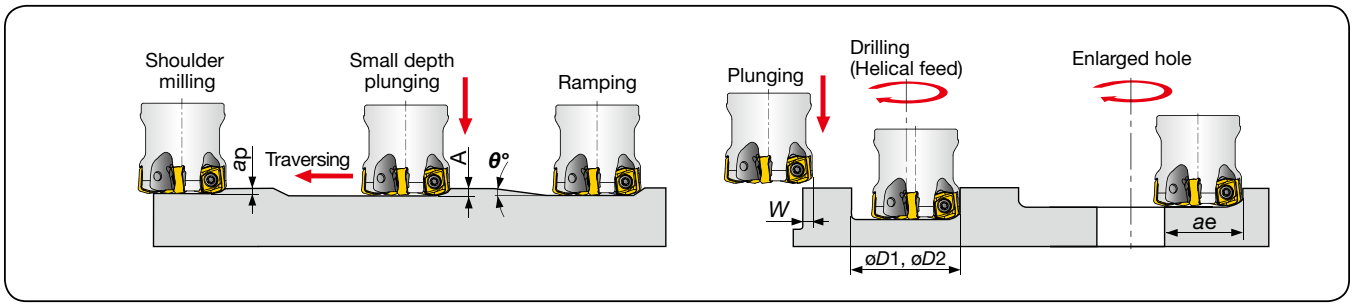
Max. depth of cut max *ap* (mm)	Corner radius r_ε	W (mm)	Corner R when program-ming	Amount left uncut t^1 (mm)	Amount left overcut t^2 (mm)
1.5	2.0	6.0	2.0	0.9	-
			3.0	0.66	-
			4.0	0.41	0.26

Each value in table is calculated theoretically at the maximum condition.

Tool dia: ø*D*c (mm), Number of revolution: *n* (min-1), Feed speed: *Vf* (mm/min), Max. depth of cut: *a*p=1.5mm, Number of teeth: z

ø50			ø63			ø80			ø100, z = 6		ø125, z = 8		ø160, z = 10		ø200, z = 12	
n	*Vf*		*n*	*Vf*		*n*	*Vf*		*n*	*Vf*	*n*	*Vf*	*n*	*Vf*	*n*	*Vf*
	z = 4	z = 5		z = 4	z = 6		z = 5	z = 8								
1,270	5,080	6,350	1,010	4,040	6,060	800	4,000	6,400	640	3,820	510	4,080	400	3,980	320	3,820
							Vc = 200 m/min, *fz* = 1.0 mm/t									
1,270	5,080	6,350	1,010	4,040	6,060	800	4,000	6,400	640	3,820	510	4,080	400	3,980	320	3,820
							Vc = 200 m/min, *fz* = 1.0 mm/t									
950	3,040	3,800	760	2,430	3,650	600	2,400	3,840	480	2,290	380	2,450	300	2,390	240	2,290
							Vc = 150 m/min, *fz* = 0.8 mm/t									
950	3,800	4,750	760	3,040	4,560	600	3,000	4,800	480	2,880	380	3,040	300	3,000	240	2,880
							Vc = 150 m/min, *fz* = 1.0 mm/t									
950	3,040	3,800	760	2,430	3,650	600	2,400	3,840	480	2,290	380	2,450	300	2,390	240	2,290
							Vc = 150 m/min, *fz* = 0.8 mm/t									
760	1,820	2,280	610	1,470	2,200	480	1,440	2,300	380	1,380	310	1,470	240	1,430	190	1,380
							Vc = 120 m/min, *fz* = 0.6 mm/t									
1,270	5,080	6,350	1,010	4,040	6,060	800	4,000	6,400	640	3,820	510	4,080	400	3,980	320	3,820
							Vc = 200 m/min, *fz* = 1.0 mm/t									
950	3,800	4,750	760	3,040	4,560	600	3,000	4,800	480	2,870	380	3,060	300	2,990	240	2,870
							Vc = 150 m/min, *fz* = 1.0 mm/t									
250	500	630	200	400	600	160	400	640	130	380	100	410	80	400	60	380
							Vc = 40 m/min, *fz* = 0.5 mm/t									
190	150	190	150	120	180	120	120	190	100	120	80	120	60	120	50	120
							Vc = 30 m/min, *fz* = 0.2 mm/t									
760	910	1,140	610	730	1,100	480	720	1,150	380	680	310	740	240	720	190	680
							Vc = 120 m/min, *fz* = 0.3mm/t									
510	410	510	400	320	480	320	320	510	250	300	200	320	160	320	130	310
							Vc = 80 m/min, *fz* = 0.2mm/t									
380	150	190	300	120	180	240	120	190	190	110	150	120	120	120	100	120
							Vc = 60 m/min, *fz* = 0.1 mm/t									
380	75	95	300	60	90	240	60	95	190	55	150	60	120	60	100	60
							Vc = 60 m/min, *fz* = 0.05 mm/t									

Applications

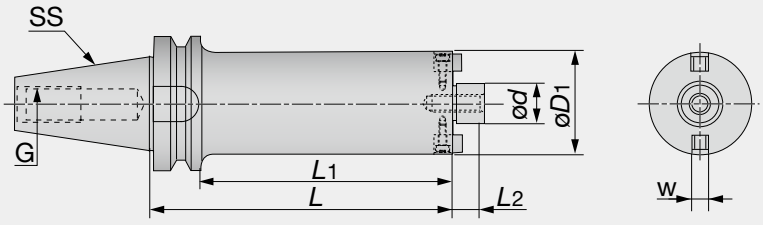


Designation	Tool dia. øDc	Max. depth of cut Max. ap	Max. ramping angle θ° MJ/ML	Max. ramping angle θ° MH	Max. plunging depth A MJ/ML	Max. plunging depth A MH	Max. cutting width in plunging W	Min.machinable hole dia. øD1	Max.machinable hole dia. øD2	Max. cutting width in enlarged hole ae
EXN06R032M...	ø32	1.5	2	1.4	0.5	0.4	6	47	59	25
EXN06R035M...	ø35	1.5	1.7	1.1	0.5	0.4	6	53	65	28
EXN06R040M...	ø40	1.5	1.3	0.8	0.5	0.4	6	63	75	33
TXN06R050M...	ø50	1.5	0.9	0.7	0.5	0.4	6	83	95	43
TXN06R052M...	ø52	1.5	0.8	0.6	0.5	0.4	6	87	99	45
TXN06R063M...	ø63	1.5	0.6	0.5	0.5	0.4	6	109	121	56
TXN06R066M...	ø66	1.5	0.5	0.5	0.5	0.4	6	115	127	59
TXN06R080M...	ø80	1.5	0.5	0.3	0.5	0.4	6	143	155	73
TXN06R100M...	ø100	1.5	0.34	0.25	0.5	0.4	6	183	195	93
TXN06R125M...	ø120	1.5	0.26	0.2	0.5	0.4	6	233	245	118
TXN06R160M...	ø160	1.5	0.2	0.15	0.5	0.4	6	303	315	153
TXN06R200M...	ø200	1.5	0.15	0.11	0.5	0.4	6	383	395	193

· For ø*D*c above 100 mm, slot milling, ramping or contouring is not recommended as chips may be re-cut.

BT50-FM (Shell mill holder for long overhang)

Face mill holder with BT shank

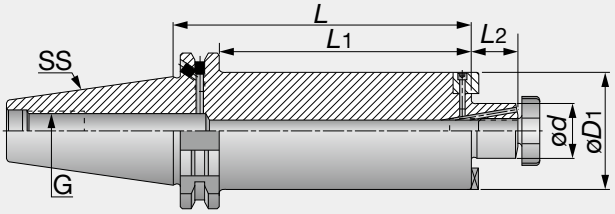


Designation	SS	ød	øD1	L2	L	L1	G	W	Kg
BT50-FMC22-138-47	50	22	47	18	138	100	M24	10	5.2
BT50-FMC22-188-47	50	22	47	18	188	150	M24	10	5.9
BT50-FMC22-243-47	50	22	47	18	243	205	M24	10	6.5
BT50-FMC22-293-47	50	22	47	18	293	255	M24	10	7.2
BT50-FMC22-178-59	50	22	59	18	178	140	M24	10	6.8
BT50-FMC22-238-59	50	22	59	18	238	200	M24	10	8
BT50-FMC22-308-59	50	22	59	18	308	270	M24	10	9.5
BT50-FMC22-373-59	50	22	59	18	373	335	M24	10	10.9
BT50-FMA31.75-215-76	50	31.75	76	30	215	177	M24	12.7	10
BT50-FMA31.75-295-76	50	31.75	76	30	295	257	M24	12.7	12.9
BT50-FMA31.75-375-76	50	31.75	76	30	375	337	M24	12.7	15.8
BT50-FMA31.75-275-96	50	31.75	96	30	275	237	M24	12.7	16.8
BT50-FMA31.75-375-96	50	31.75	96	30	375	337	M24	12.7	23

(Option:Wrench for lock screw)

DIN69871-SEM (Shell mill holder with extra long)

Extra long type shell mill holder with coolant hole with DIN69871 shank



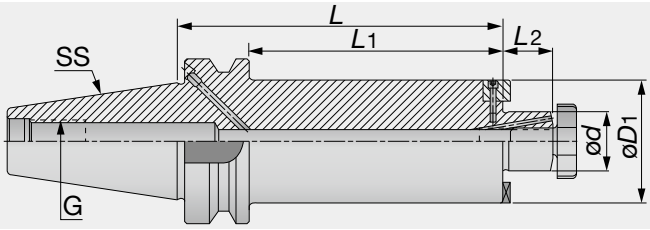
Designation	SS	ød	L2	øD1	L	L1	G
DIN6987150SEM22X48X200C	50	22	19	48	200	181	M24
DIN6987150SEM22X61X300C	50	22	19	61	300	281	M24
DIN6987150SEM27X61X300C	50	27	21	61	300	281	M24

• Applicable for 10 MPa pressure coolant
• If the "B type" option is required, the plug screw must the removed from the flange cooling hole. (use a 2 mm hex key.)

(Option:Wrench for lock screw)

BT-SEM-C (Shell mill holder)

Shell mill holder with coolant hole with BT shank (Extra long type)

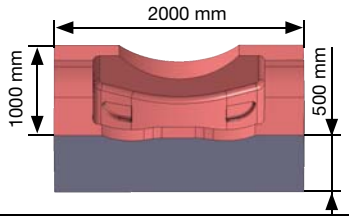
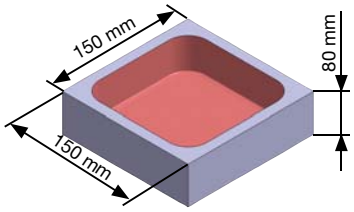
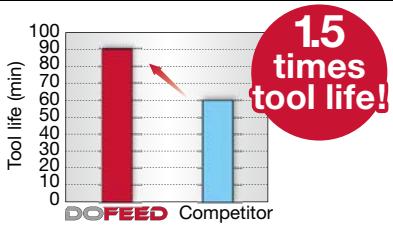
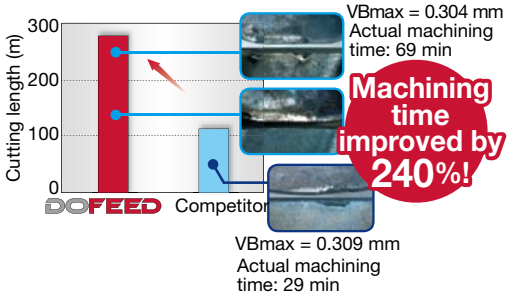


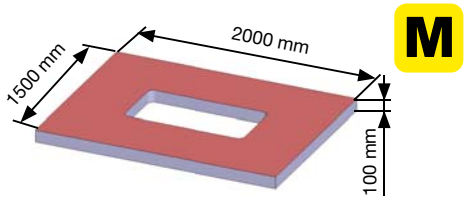
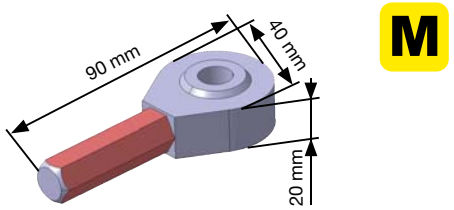
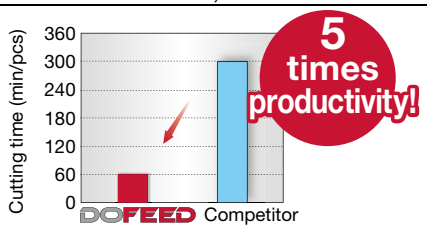
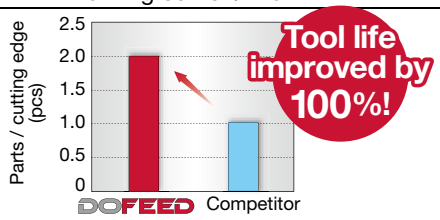
Designation	SS	ød	øD1	L	L1	L2	G
BT50SEM22X48X220C	50	22	48	220	182	19	M24
BT50SEM22X61X320C	50	22	61	320	282	19	M24
BT50SEM27X61X320C	50	27	61	320	282	21	M24

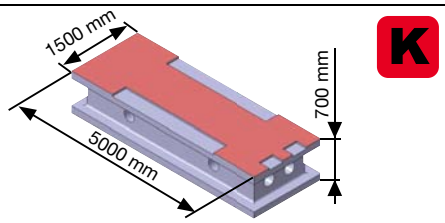
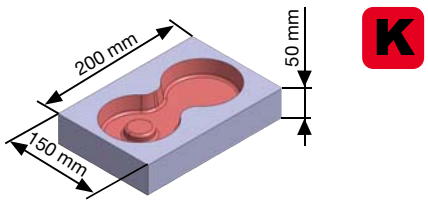
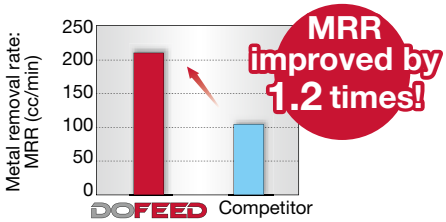
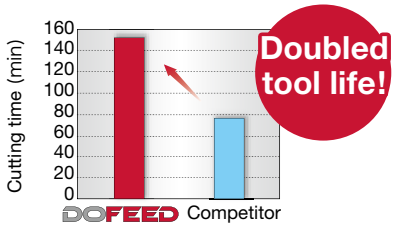
• Applicable for 10 MPa pressure coolant
• If the "B type" option is required, the plug screw must be removed from the flange cooling hole (use a 2 mm hex key).

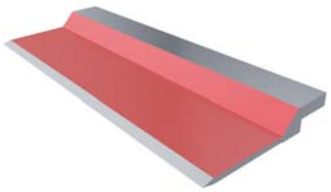
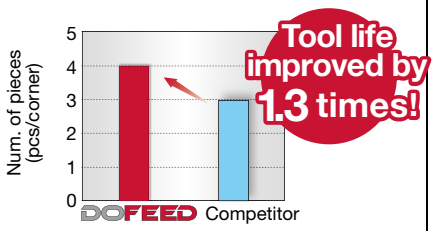
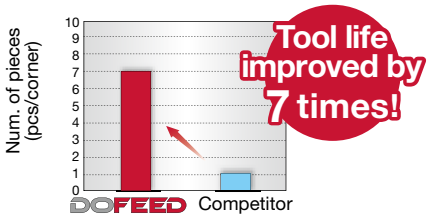
(Option:Wrench for lock screw)

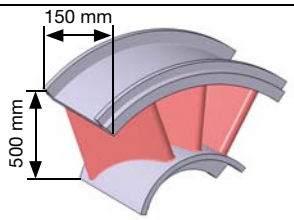
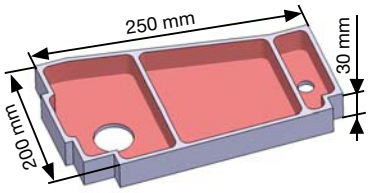
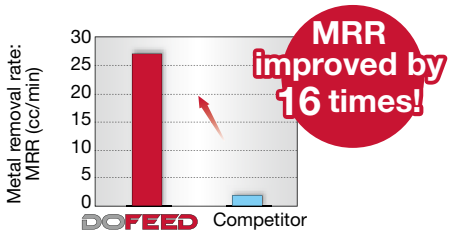
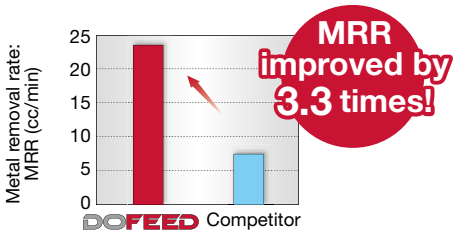
PRACTICAL EXAMPLES

Workpiece type		Die & Mould / Back block	Machine parts
Cutter		TXN06R063M22.2-06 (ø63, z = 6)	EXN03R025M25.0-05 (ø25, z = 5)
Insert		LNMU06X5ZER-MJ	LNMU0303ZER-MJ
Grade		AH3035	AH725
Workpiece material		Prehardened steel HPM7 (HRC30)	Prehardened steel (40HRC)
		 P	 P
Cutting conditions	Cutting speed: *Vc* (m/min)	115	100
	Feed per tooth: *fz* (mm/t)	0.7	0.8
	Depth of cut: *ap* (mm)	1.1	0.5
	Width of cut: *ae* (mm)	42	18
	Process	Contour milling	Pocket milling
	Coolant	Air blow	Dry (air)
	Machine	Vertical M/C, BT50	Vertical M/C, BT40
Results		 AH3035 grade showed better chipping resistance than competitor improving tool life by 50%.	

Workpiece type		Machine frame	Automotive / Rod end
Cutter		TXN06R080M31.7-08 (ø80, z = 8)	EXN03R032M32.0-06 (ø32, z = 6)
Insert		LNMU06X5ZER-ML x 7 / LNGU06X5ZER-W x 1	LNMU0303ZER-ML
Grade		AH130 / AH725	AH130
Workpiece material		SUS304 / X5CrNi18-9	SUS630 / X5CrNiCuNb16-4
			
Cutting conditions	Cutting speed: *Vc* (m/min)	100	70
	Feed per tooth: *fz* (mm/t)	0.4	0.15
	Feed speed: *Vf* (mm/min)	1273	-
	Depth of cut: *ap* (mm)	0.5	1
	Width of cut: *ae* (mm)	60	40
	Process	Face milling	Face milling
	Coolant	Wet	Internal supply
	Machine	Vertical M/C, BT50	Turning center / 7.5 kW
Results		 Competitor's tool took 300 minutes for roughing and finishing. DoFeed with wiper insert reduces time for finishing and improves total productivity by 5 times that of the competitor.	 DoFeed is a versatile cutter and was used against a shoulder milling cutter, achieving double tool life.

Workpiece type		Large machine parts	Die & mould
Cutter		TXN06R200M47.6-12 (ø200, z = 12)	HXN03R020MM10-04 (ø20, z = 4)
Insert		LNMU06X5ZER-MJ	LNMU0303ZER-MJ
Grade		AH120	AH725
Workpiece material		FCD600 / 600-3	FCD600 / 600-3
			
Cutting conditions	Cutting speed: *Vc* (m/min)	150	190
	Feed per tooth: *fz* (mm/t)	1.0	0.4
	Depth of cut: *ap* (mm)	0.5	0.3
	Width of cut: *ae* (mm)	150	9
	Process	Face milling	Pocket milling
	Coolant	Dry	Dry (air)
	Machine	Horizontal M/C, BT50	Vertical M/C, BT40
Results		 DoFeed, with high density insert, can effectively increase productivity. Lower cutting forces reduce chattering, achieving 1.5 times tool life.	 Due to the lower cutting forces, DoFeed can increase the productivity 4 times higher. AH725 grade can effectively reduce sudden fracture, achieving double tool life.

Workpiece type		Press-cutter blade	Machine part
Cutter		TXN06R063M22.0E06 (ø63, z = 6)	EXN03R035M32.0-06 (ø35, z = 6)
Insert		LNGU06X5ZER-MH	LNMU0303ZER-MJ
Grade		AH8015	AH8015
Workpiece material		SCM440/42CrMo4(44HRC)	SCM440/42CrMo4(44HRC)
		 H	 H
Cutting conditions	Cutting speed: *Vc* (m/min)	118	170
	Feed per tooth: *fz* (mm/t)	0.8	0.8
	Depth of cut: *ap* (mm)	0.8	0.92
	Width of cut: *ae* (mm)	38	26
	Process	Face milling	Pocketing
	Coolant	Dry (air)	Air blast
	Machine	Vertical M/C	Vertical M/C
Results		 A combination of the MH chipbreaker and AH8015 reduced chipping and wear. Tool life has increased to 130%.	 AH8015 exhibited superior wear resistance, improving the tool life by sevenfold over the competitor.

Workpiece type		Turbine blade	Aerospace component
Cutter		EXN03R030M32.0-05 (ø30, z = 5)	EXN03R025M25.0-05 (ø25, z = 5)
Insert		LNMU0303ZER-ML	LNMU0303ZER-ML
Grade		AH725	AH725
Workpiece material		Heat resistant cast steel	Ti-6Al-4V (36HRC)
		 S	 S
Cutting conditions	Cutting speed: *Vc* (m/min)	70	50
	Feed per tooth: *fz* (mm/t)	0.5	0.7
	Depth of cut: *ap* (mm)	0.5	0.5
	Width of cut: *ae* (mm)	30	25
	Process	Shoulder milling	Pocket milling
	Coolant	Wet	Wet
	Machine	Vertical M/C, BT50	Vertical M/C, BT40
Results		 Tripled cutting speed and super high feed milling offer 16 times higher productivity.	 7.3 times higher feed machining that drastically improves productivity.

Tungaloy Corporation (Head office)
11-1 Yoshima-Kogyodanchi
Iwaki-city, Fukushima, 970-1144 Japan
Phone: +81-246-36-8501
Fax: +81-246-36-8542
www.tungaloy.co.jp

Tungaloy America, Inc.
3726 N Ventura Drive
Arlington Heights,IL 60004, U.S.A.
Phone: +1-888-554-8394
Fax: +1-888-554-8392
www.tungaloyamerica.com

Tungaloy Canada
432 Elgin St. Unit 3
Brantford, Ontario N3S 7P7, Canada
Phone: +1-519-758-5779
Fax: +1-519-758-5791
www.tungaloy.co.jp/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.co.jp/mx

Tungaloy do Brasil Ltda.
Avd. Independencia N4158 Residencial Flora
13280-000 Vinhedo, São Paulo, Brasil
Phone: +55-19-38262757
Fax: +55-19-38262757
www.tungaloy.com/br

Tungaloy Germany GmbH
An der Alten Ziegelei 1
D-40789 Monheim, Germany
Phone: +49-2173-90420-0
Fax: +49-2173-90420-19
www.tungaloy.de

Tungaloy France S.A.S.
ZA Courtaboeuf - Le Rio
1 rue de la Terre de feu
F-91952 Courtaboeuf Cedex, France
Phone: +33-1-6486-4300
Fax: +33-1-6907-7817
www.tungaloy.fr

Tungaloy Italia S.r.l.
Via E. Andolfato 10
I-20126 Milano, Italy
Phone: +39-02-252012-1
Fax: +39-02-252012-65
www.tungaloy.it

Tungaloy Czech s.r.o.
Turanka 115
CZ-627 00 Brno, Czech Republic
Phone: +420-532 123 391
Fax: +420-532 123 392
www.tungaloy.cz

Tungaloy Ibérica S.L.
C/Miquel Servet, 43B, Nau 7
Pol. Ind. Bufalvent
ES-08243 Manresa (BCN), Spain
Phone: +34 93 113 1360
Fax: +34 93 876 2798
www.tungaloy.es

Tungaloy Scandinavia AB
Bultgatan 38
442 40 Kungälv, Sweden
Phone: +46-462119200
www.tungaloy.se

Tungaloy Rus, LLC
Andropova avenue, h.18/7,
11 floor, office 3, 115432,
Moscow, Russia
Phone: +7-499-683-01-80
Fax: +7-499-683-01-81
www.tungaloy.co.jp/ru

Tungaloy East LLC
620075, Russian Federation, Sverdlovsk
Region, Ekaterinburg, Mamina-Sibiryaka str.,
bldg. 101, room 202
Phone: +7-343-286-48-23/24
Fax: +7-912-284-91-69
www.tungaloy.co.jp/rue

Tungaloy Polska Sp. z o.o.
ul. Genewska 24
03-963 Warszawa, Poland
Phone: +48-22-617-0890
Fax: +48-22-617-0890
www.tungaloy.co.jp/pl

Tungaloy U.K. Ltd
The Technology Centre,
Wolverhampton Science Park
Glaisher Drive, Wolverhampton
West Midlands WV10 9RU, UK
Phone: +44 121 4000 231
Fax: +44 121 270 9694
www.tungaloy.co.jp/uk
salesinfo@tungaloyuk.co.uk

Tungaloy Hungary Kft
Erzsébet királyné útja 125
H-1142 Budapest, Hungary
Phone: +36 1 781-6846
Fax: +36 1 781-6866
www.tungaloy.co.jp/hu
info@tungaloytools.hu

Tungaloy Turkey
Dudullu,OSB 4. Cad No:4
34776 Umraniye Istanbul, TURKEY
Phone: +90 216 540 04 67
Fax: +90 216 540 04 87
www.tungaloy.com.tr
info@tungaloy.com.tr

Tungaloy Benelux b.v.
Tjalk 70
NL-2411 NZ Bodegraven, Netherlands
Phone: +31 172 630 420
Fax: +31 172 630 429
www.tungaloy-benelux.com

Tungaloy Croatia
Josipa Kozarca 4
10432 Bregana, Croatia
Phone: +385 1 3326 604
Fax: +385 1 3327 683
www.tungaloy.hr

Tungaloy Cutting Tool (Shanghai) Co.,Ltd.
Rm No 401 No.88 Zhabei
Jiangchang No.3 Rd
Shanghai 200436, China
Phone: +86-21-3632-1880
Fax: +86-21-3621-1918
www.tungaloy.co.jp/tcts

Tungaloy Cutting Tool (Thailand) Co.,Ltd.
Interlink tower 4th Fl.
1858/5-7 Bangna-Trad Road
km.5 Bangna, Bangna, Bangkok 10260
Thailand
Phone: +66-2-751-5711
Fax: +66-2-751-5715
www.tungaloy.co.th

Tungaloy Singapore (Pte.), Ltd.
62 Ubi Road 1, #06-11 Oxley BizHub 2
Singapore 408734
Phone: +65-6391-1833
Fax: +65-6299-4557
www.tungaloy.co.jp/tspl

Tungaloy Vietnam
LE 04-38, Lexington Residence
67 Mai Chi Tho, Dist. 2,
Ho Chi Minh City, Vietnam
Phone: +84-8-37406660
Fax: +84-8-37406662
www.tungaloy.co.jp/tspl

Tungaloy India Pvt. Ltd.
Indiabulls Finance Centre,
Unit # 902-A, 9th Floor,
Tower 1, Senapati Bapat Marg,
Elphinstone Road (West),
Mumbai -400013, India
Phone: +91-22-6124-8804
Fax: +91-22-6124-8899
www.tungaloy.co.jp/in

Tungaloy Korea Co., Ltd
#1312, Byucksan Digital Valley 5-cha
Beotkkot-ro 244, Geumcheon-gu
153-788 Seoul, Korea
Phone: +82-2-2621-6161
Fax: +82-2-6393-8952
www.tungaloy.co.jp/kr

Tungaloy Malaysia Sdn Bhd
50 K-2, Kelana Mall, Jalan SS6/14
Kelana Jaya, 47301
Petaling Jaya, Selangor Darul Ehsan
Malaysia
Phone: +603-7805-3222
Fax: +603-7804-8563
www.tungaloy.co.jp/my

Tungaloy Australia Pty Ltd
PO Box 2232, Rowville,
Victoria 3178, Australia
Phone: +61-3-9755-8147
Fax: +61-3-9755-6070
www.tungaloy.com.au

PT. Tungaloy Indonesia
Kompleks Grand Wisata Block AA-10 No.3-5
Cibitung
Bekasi 17510, Indonesia
Phone: +62-21-8261-5808
Fax: +62-21-8261-5809
www.tungaloy.co.jp/id

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