

MillLine
DOFEED

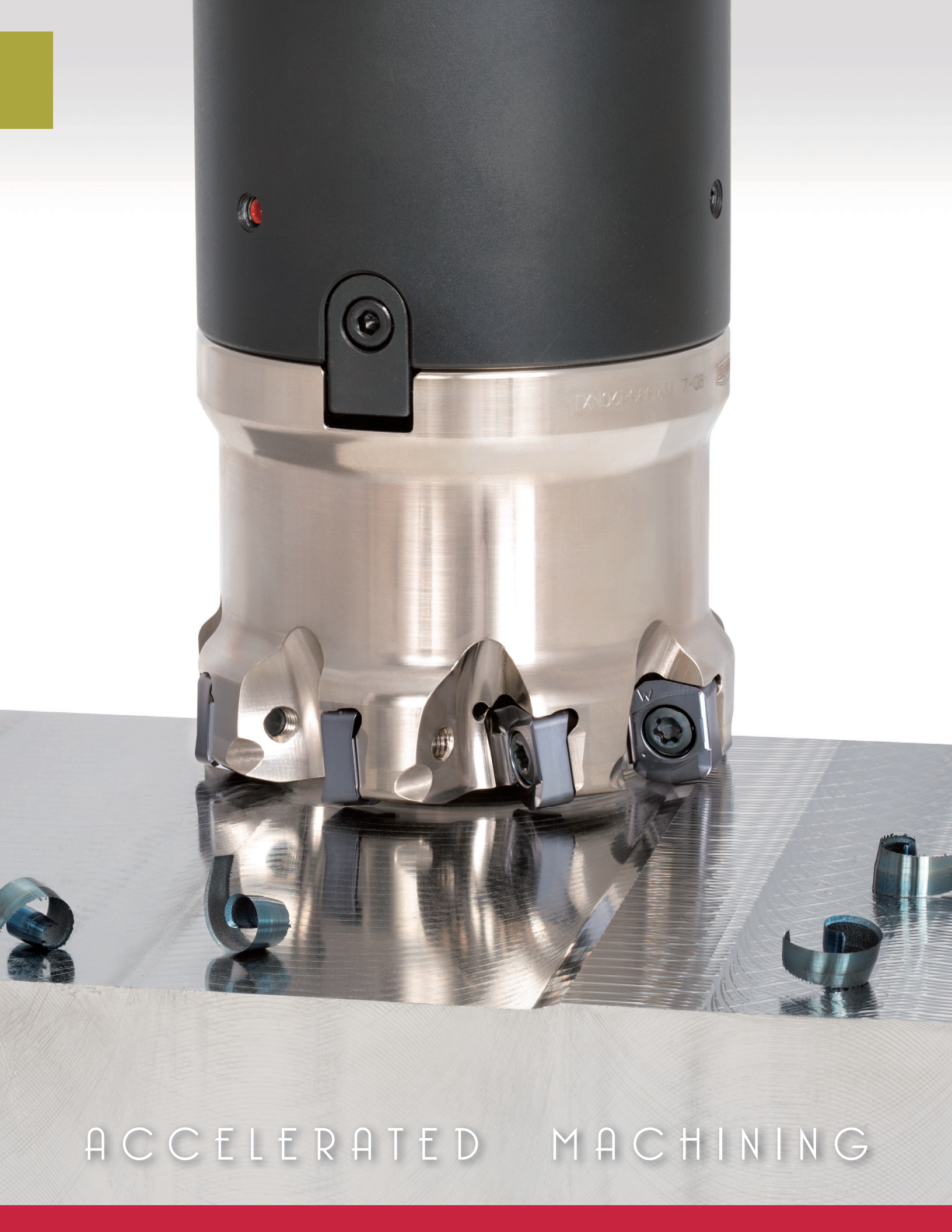
www.tungaloy.com/us
Tungaloy Report No. 403-US



Super high feed cutter **now expanded** **with the newest grade AH3225**



INDUSTRY 4.0
FEED the SPEED!



ACCELERATED MACHINING



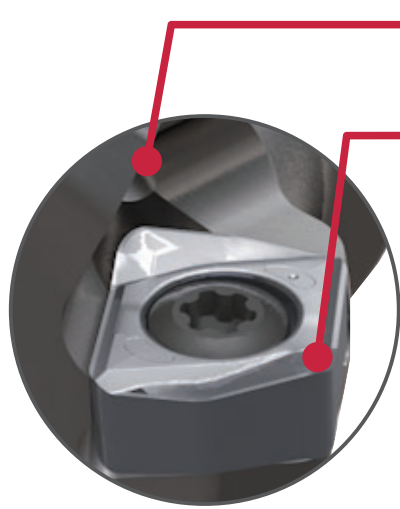
High-feed cutters reduce machining time **for a wide range of applications.**

Innovative high-feed cutters!

DoFeed offers outstanding productivity thanks to its close-pitch insert orientation and light cutting geometry. The rich lineup is suitable for a wide variety of applications.


Outstanding productivity

Excellent chip evacuation prevents chip packing

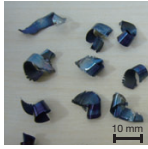


Optimized coolant jet delivery effectively removes chips and prevents chip re-cutting

Large inclination forms ideal chips and controls the chip flow



DOFEED
Good
Curl consistently
at ideal length

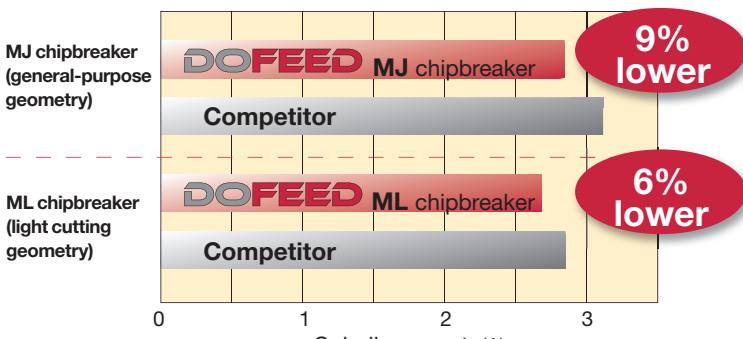


Competitor
Poor
Crushed or unstable

P Steel	Cutter : TXN06R200U0075A05 Insert : LNMU06X5ZER-MJ Grade : AH725 Workpiece material: Carbon steels (1055) Cutting speed : Vc = 590 sfm Feed per tooth : fz = 0.070 ipt Depth of cut : ap = 0.039" Coolant : Dry Machine : Vertical M/C, CAT50
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Innovative geometry allows for extremely light cutting for negative inserts

Comparison of spindle load



P Steel	Cutter : EXN03R100U0100-05 (ø1.000", z = 5) Insert : LNMU0303ZER-MJ / ML Grade : AH725 Workpiece material : Carbon steels (1055) Cutting speed : Vc = 820 sfm Feed per tooth : fz = 0.020 ipt (1 insert) Depth of cut : ap = 0.020" Width of cut : ae = 1.000" (Slot milling) Coolant : Dry Machine : Vertical M/C, CAT40
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Close pitch cutters for high productivity!

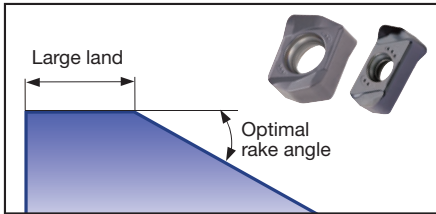
Tool dia. DCX (inch)	No. of inserts (z)		Competitor	Productivity improvement compared to competitor
	Coarse pitch	Close pitch		
ø1.000"	4	5	4	1.3 times
ø2.000"	4	5	4	1.3 times
ø2.500"	4	6	4	1.5 times

· ø1.000" is based on EXN03 type
 · ø2.000" and ø2.500" are based on TXN06 type

Extensive application coverage with a large variety of items

Four chipbreakers and wiper insert for all machining needs

MJ General machining

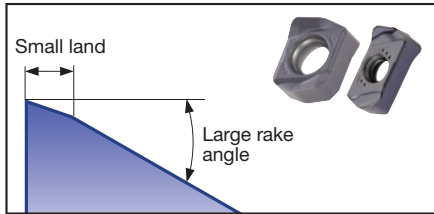


P M K S H

4 cutting edges

- Excellent combination of sharpness and strength
- Ideal for machining steel, cast iron and hardened steel

ML Low cutting force

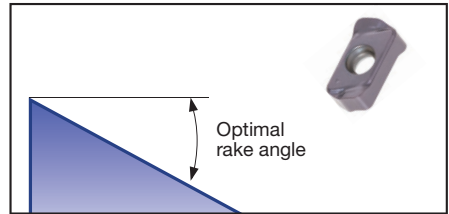


P M S

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

MS For stainless steel

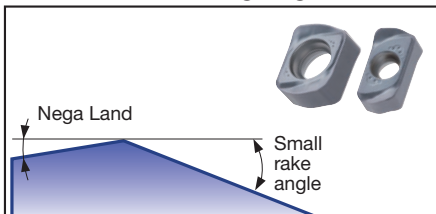


M

4 cutting edges

- Sharp cutting edge
- Most suited for stainless steel milling

MH Robust cutting edges



H

4 cutting edges

- Robust cutting edges
- Suitable for hardened steel

W Wiper insert



P M K S H

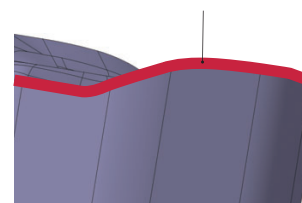
2 cutting edges

- Excellent surface finish while maintaining high productivity

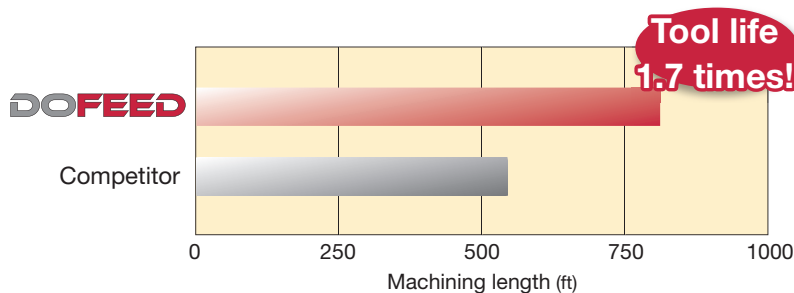
MS chipbreaker - features

- Sharp cutting edge ensures light cutting, while preventing built-up edge to ensure long tool life during stainless steel machining
- Large inclination on the cutting edge reduces impact at the entry of the cut, eliminating chatter or chipping

Large inclination on cutting edge



■ Tool life comparison in stainless steel milling



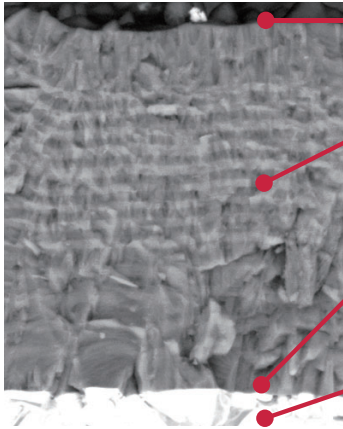
M
Stainless

Cutter	: EXN03R020M20.0-04-C (ø20 mm, z = 4)
Insert	: LNMU0303ZER-MS
Grade	: AH130
Workpiece material	: S30400
Cutting speed	: Vc = 490 sfm
Feed per tooth	: fz = 0.024 ipt
Depth of cut	: ap = 0.024"
Width of cut	: ae = 0.400 "
Coolant	: Dry
Machine	: Vertical M/C, CAT40

Grades with long tool life for a wide range of materials

New **AH3225** **P M**

- 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



Technology 1 - Resistance to built-up edge

The coating surface prevents built-up edge

Technology 2 - 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

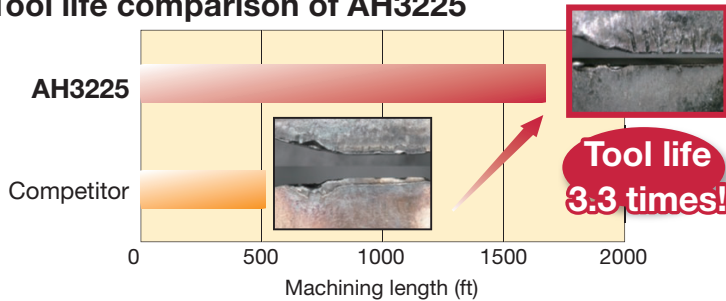
Technology 3 - Strong coating/substrate adhesion

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

Carbide substrate

High resistance to fracture

Tool life comparison of AH3225



P	Cutter	: EXN03R100U0100-05-C
	Insert	: LNMU0303ZER-MJ
	Grade	: AH3225
	Workpiece material	: Carbon steels (1055)
	Cutting speed	: Vc = 660 sfm
	Feed per tooth	: fz = 0.039 ipt
	Depth of cut	: ap = 0.024"
	Width of cut	: ae = 0.6"
	Coolant	: Dry
	Machine	: Vertical M/C, CAT50

AH3035



Steel Stainless

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

AH725



Steel Cast iron Superalloys Hard Materials

- Superior grade for all general machining applications.
- Excellent wear and fracture resistance in cast iron machining.

AH130



Superalloys Stainless

- High chipping resistance
- Ideal for titanium alloy machining

AH120



Cast iron

- Exceptionally wear resistance in cast iron machining

AH8015



Hard Materials Steel Cast iron

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

AH8005



Hard Materials

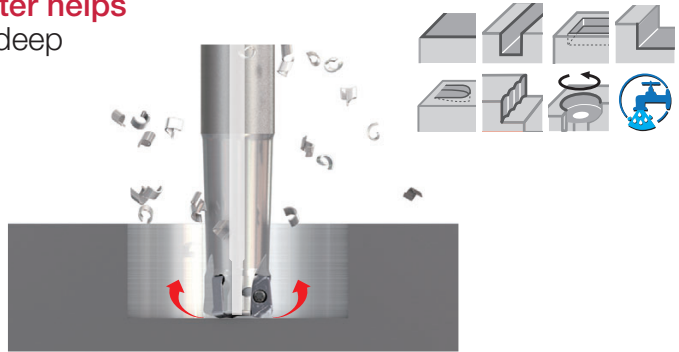
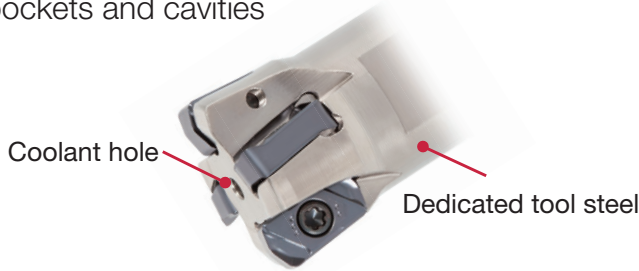
- High wear, chipping resistance and minimized built-up edge due to nano multi-layered AlTiN coating with high Al content
- Ideal for hardened steel of 55HRc and above

Two types of spindle-through coolant supply systems (EXN03/HXN03)

Premium Body

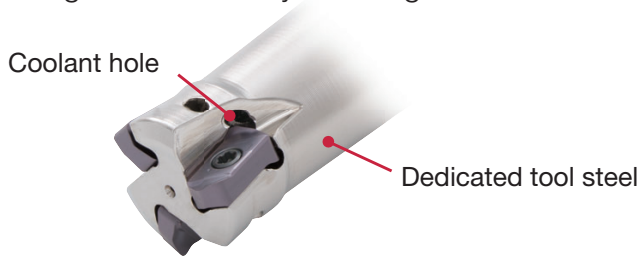
- Robust tool body design in special tool steel
- Two types of internal coolant channel designs are available:

1. Coolant supplied through the tool axial center helps evacuate chip effectively in milling blind holes, deep pockets and cavities

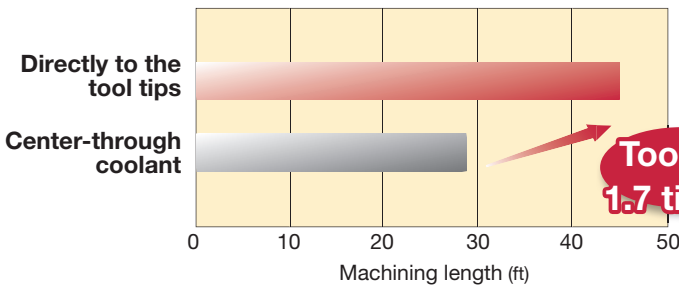


2. Coolant supplied directly to each cutting edge is ideal for ISO S materials

For shouldering with a small radial immersion where the optimal coolant supply to the tip of the cutting edge is vital for reducing cutting heat and built-up edge, while improving tool life stability in milling difficult materials.



Improved tool life thanks to optimal coolant supply



Improved tool life by 170% due to controlling the cutting heat

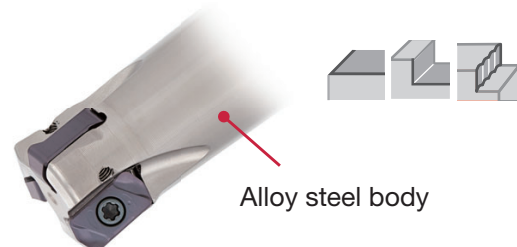


Cutter	: EXN03R075U0075-03 (Center-through coolant, $\phi 0.750$, $z = 3$) : EXN03R075U0075-03-C (Directly to the tool tips, $\phi 0.750$, $z = 3$)
Insert	: LNMU0303ZER-ML
Grade	: AH725
Workpiece material	: Inconel718 (46HRC)
Cutting speed	: $V_c = 131$ sfm
Feed per tooth	: $f_z = 0.012$ ipt
Depth of cut	: $a_p = 0.020$ "
Width of cut	: $a_e = 0.197$ "
Coolant	: Wet
Process	: Shouldering
Machine	: Vertical M/C, CAT50








3. ECO body

- Steel body with no internal coolant channels
- Economical solution for machining faces, shoulders and shallow pockets where chip evacuation is relatively easy with external coolant supply

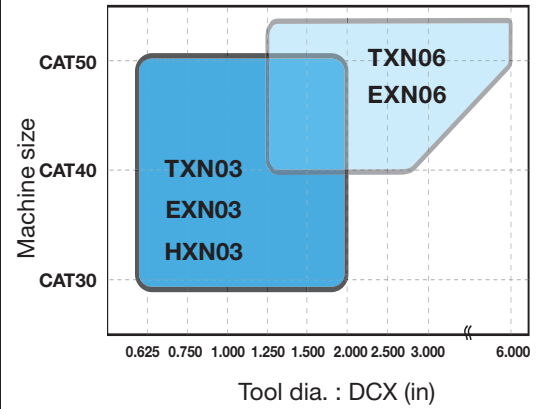
* To avoid chip re-cutting, ECO body is NOT recommended for slotting or pocketing with depths of cut (a_p) exceeding 0.394".



Rich lineup of cutter bodies from $\varnothing 0.625''$ to $\varnothing 6.000''$

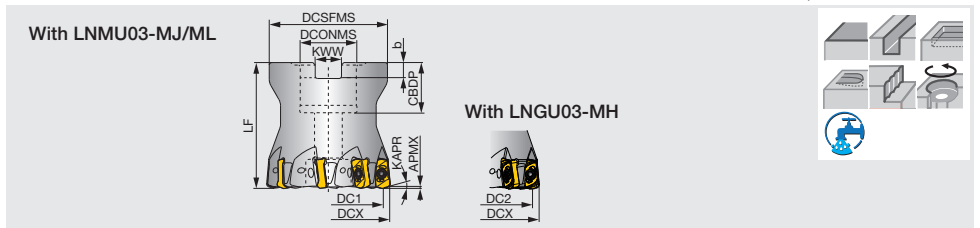
Insert	Bore type	Shank type	Modular type
LNMU03  Max. ap = 0.039"	TXN03 (DCX = 1.500" - 2.000") 	EXN03 (DCX = 0.625" - 1.250") 	HXN03 (DCX = 16 - 32 mm 0.630" - 1.260") 
LN*U06  Max. ap = 0.059"	TXN06 (DCX = 2.000" - 6.000") 	EXN06 (DCX = 1.250" - 1.500") 	

■ Applicable area



TXN03

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



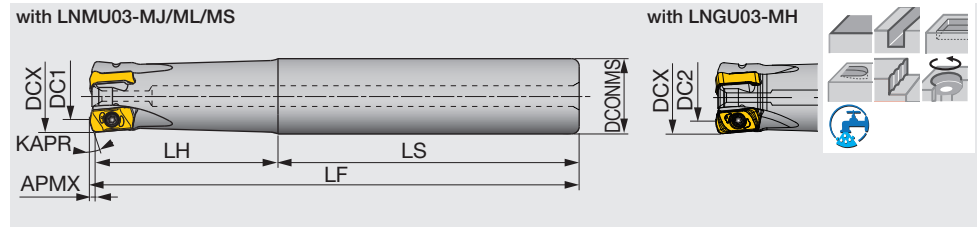
Inch	APMX	DCX	CICT	DC1	DC2	DCSFMS	DCONMS	CBDP	LF	b	KWW	KAPR	WT (lb)	Air hole	Insert
TXN03R150U0050A05	0.039	1.500	5	1.248	1.247	1.460	0.500	0.750	1.575	0.160	0.252	17°	0.530	With	LN*U03...
TXN03R150U0050A06	0.039	1.500	6	1.248	1.247	1.380	0.500	0.600	1.575	0.160	0.252	17°	0.510	With	LN*U03...
TXN03R200U0075A05	0.039	2.000	5	1.718	1.757	1.693	0.750	0.750	1.969	0.197	0.315	17°	1.100	With	LN*U03...
TXN03R200U0075A08	0.039	2.000	8	1.718	1.757	1.693	0.750	0.750	1.969	0.197	0.315	17°	1.100	With	LN*U03...
TXN03R200U0075A10	0.039	2.000	10	1.718	1.757	1.693	0.750	0.750	1.969	0.197	0.315	17°	1.100	With	LN*U03...

SPARE PARTS				
Designation	Clamping screw	Lubricant	Shell locking bolt (optional parts)	Wrench
TXN03...	CSPB-2.5	M-1000	C0.375X1.125H	IP-8D

*Recommended clamping torque : CSPB-2.5=0.96 lbf-ft

EXN03

Super high feed milling endmills with double sided inserts with 4 edges
(Through-center coolant supply)



Inch	APMX	DCX	CICT	DC	DC2	DCONMS	LF	LH	LS	KAPR	WT(lb)	Air hole	Insert
EXN03R062U0062-02	0.039	0.625	2	0.372	0.381	0.625	4.000	1.250	2.750	15°	0.310	With	LN*U03...
EXN03R062U0062-02L	0.039	0.625	2	0.372	0.381	0.625	6.000	2.000	4.000	15°	0.460	With	LN*U03...
EXN03R068U0062-02	0.039	0.688	2	0.434	0.436	0.625	4.000	1.250	2.750	17°	0.310	With	LN*U03...
EXN03R068U0062-02L	0.039	0.688	2	0.434	0.436	0.625	6.000	1.000	5.000	17°	0.490	With	LN*U03...
EXN03R075U0075-02	0.039	0.750	2	0.495	0.498	0.750	5.000	2.000	3.000	17°	0.550	With	LN*U03...
EXN03R075U0075-03	0.039	0.750	3	0.495	0.498	0.750	5.000	2.000	3.000	17°	0.550	With	LN*U03...
EXN03R075U0075-03L	0.039	0.750	3	0.495	0.498	0.750	6.500	3.500	3.000	17°	0.710	With	LN*U03...
EXN03R087U0075-02	0.039	0.875	2	0.621	0.623	0.750	5.000	2.000	3.000	17°	0.570	With	LN*U03...
EXN03R087U0075-03	0.039	0.875	3	0.621	0.623	0.750	5.000	2.000	3.000	17°	0.570	With	LN*U03...
EXN03R087U0075-03L	0.039	0.875	3	0.621	0.623	0.750	6.500	1.250	5.250	17°	0.750	With	LN*U03...
EXN03R100U0100-04	0.039	1.000	4	0.746	0.748	1.000	5.500	2.500	3.000	17°	1.080	With	LN*U03...
EXN03R100U0100-04L	0.039	1.000	4	0.746	0.748	1.000	7.000	4.000	3.000	17°	1.340	With	LN*U03...
EXN03R100U0100-05	0.039	1.000	5	0.746	0.748	1.000	5.500	2.500	3.000	17°	1.080	With	LN*U03...
EXN03R112U0100-04	0.039	1.125	4	0.871	0.872	1.000	5.500	2.500	3.000	17°	1.120	With	LN*U03...
EXN03R112U0100-04L	0.039	1.125	4	0.871	0.872	1.000	7.000	1.500	5.500	17°	1.460	With	LN*U03...
EXN03R112U0100-05	0.039	1.125	5	0.871	0.872	1.000	5.500	2.500	3.000	17°	1.120	With	LN*U03...
EXN03R125U0125-05	0.039	1.250	5	0.997	0.997	1.250	6.000	3.000	3.000	17°	1.870	With	LN*U03...
EXN03R125U0125-05L	0.039	1.250	5	0.997	0.997	1.250	8.000	5.000	3.000	17°	2.430	With	LN*U03...
EXN03R125U0125-06	0.039	1.250	6	0.997	0.997	1.250	6.000	3.000	3.000	17°	1.850	With	LN*U03...

SPARE PARTS



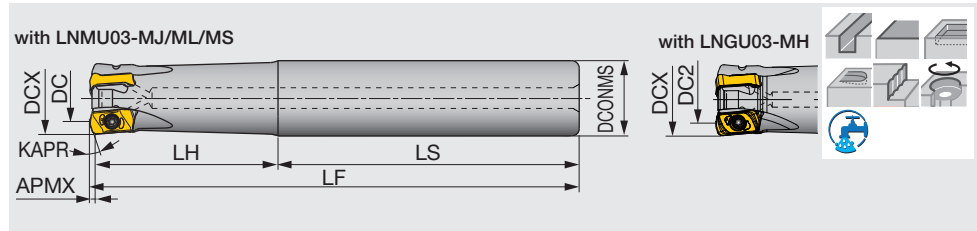
Designation	Clamping screw	Lubricant	Wrench
EXN03...	CSPB-2.5	M-1000	IP-8D

*Recommended clamping torque : CSPB-2.5=0.96 lbf-ft

EXN03-C

Super high feed milling endmills with double sided inserts with 4 edges (Directly to the tool tips)

GAMP = +6°, GAMF = +5° ~ +11°



Inch	APMX	DCX	CICT	DC	DC2	DCONMS	LF	LH	LS	KAPR	WT(lb)	Air hole	Insert
EXN03R075U0075-03-C	0.039	0.750	3	0.494	0.498	0.750	5.000	2.000	3.000	17°	0.660	With	LN*U03...
EXN03R087U0075-03-C	0.039	0.875	3	0.634	0.623	0.750	5.000	2.000	3.000	17°	0.660	With	LN*U03...
EXN03R100U0100-05-C	0.039	1.000	5	0.756	0.748	1.000	5.500	2.500	3.000	17°	1.100	With	LN*U03...
EXN03R125U0125-06-C	0.039	1.250	6	1.008	0.997	1.250	6.000	3.000	3.000	17°	1.760	With	LN*U03...

Metric	APMX	DCX	CICT	DC	DC2	DCONMS	LF	LH	LS	KAPR	WT(kg)	Air hole	Insert
EXN03R016M16.0-02-C	1	16	2	9.6	9.8	16	100	30	70	15°	0.2	With	LN*U03...
EXN03R016M16.0-02L-C	1	16	2	9.6	9.8	16	150	50	100	15°	0.2	With	LN*U03...
EXN03R020M20.0-03-C	1	20	3	13.5	13.6	20	130	50	80	17°	0.3	With	LN*U03...
EXN03R020M20.0-03L-C	1	20	3	13.5	13.6	20	160	80	80	17°	0.3	With	LN*U03...
EXN03R020M20.0-04-C	1	20	4	13.5	13.6	20	130	50	80	17°	0.3	With	LN*U03...
EXN03R025M25.0-04-C	1	25	4	18.5	18.6	25	140	60	80	17°	0.5	With	LN*U03...
EXN03R025M25.0-04L-C	1	25	4	18.5	18.6	25	180	100	80	17°	0.6	With	LN*U03...
EXN03R025M25.0-05-C	1	25	5	18.5	18.6	25	130	60	80	17°	0.5	With	LN*U03...
EXN03R032M32.0-05-C	1	32	5	25.5	25.6	32	150	70	80	17°	0.8	With	LN*U03...
EXN03R032M32.0-05L-C	1	32	5	25.5	25.6	32	200	120	80	17°	1.1	With	LN*U03...
EXN03R032M32.0-06-C	1	32	6	25.5	25.6	32	150	70	80	17°	0.8	With	LN*U03...
EXN03R040M32.0-06-C	1	40	6	33.6	33.7	32	150	45	105	17°	1	With	LN*U03...
EXN03R040M32.0-06L-C	1	40	6	33.6	33.7	32	220	45	175	17°	1.4	With	LN*U03...

SPARE PARTS



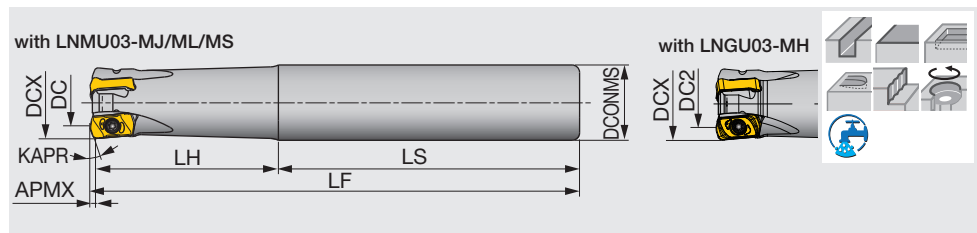
Designation	Clamping screw	Lubricant	Wrench
EXN03...	CSPB-2.5	M-1000	IP-8D

*Recommended clamping torque : CSPB-2.5=0.96 lbf-ft, 1.3 N-m

EXN03-N

Super high feed milling endmills with double sided inserts (Eco)

GAMP = +6°, GAMF = +5° ~ +11°



Metric	APMX	DCX	CICT	DC	DC2	DCONMS	LF	LH	LS	KAPR	WT(kg)	Air hole	Insert
EXN03R016M16.0-02N	1	16	2	9.6	9.8	16	100	30	70	15°	0.2	With	LN*U03...
EXN03R020M20.0-03N	1	20	3	13.5	13.6	20	130	50	80	17°	0.3	With	LN*U03...
EXN03R025M25.0-04N	1	25	4	18.5	18.6	25	140	60	80	17°	0.5	With	LN*U03...
EXN03R032M32.0-05N	1	32	5	25.5	25.6	32	150	70	80	17°	0.8	With	LN*U03...

SPARE PARTS

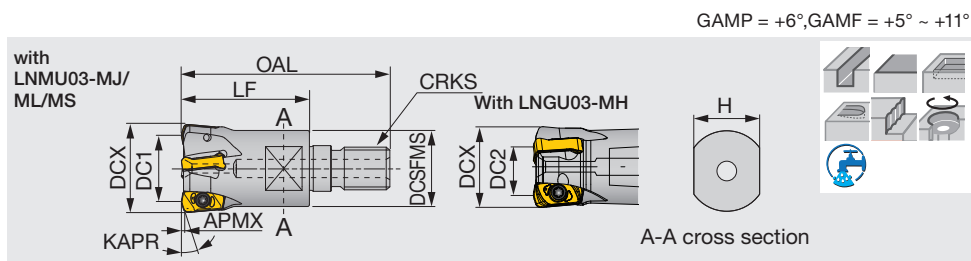


Designation	Clamping screw	Lubricant	Wrench
EXN03...	CSPB-2.5	M-1000	IP-8D

*Recommended clamping torque : CSPB-2.5=1.3 N-m

HXN03

Super high feed milling endmills (Dofeed) with TungFlex (Through-center coolant supply)



Metric	APMX	DCX	CICT	DC	DC2	OAL	LF	H	DCSFMS	KAPR	CRKS	WT(kg)	Air hole	Insert
HXN03R016MM08-02	1	16	2	9.6	9.8	42	25	10	12.8	15°	M8	0.03	With	LN*U03...
HXN03R018MM08-02	1	18	2	11.5	11.7	42	25	10	14.5	17°	M8	0.04	With	LN*U03...
HXN03R020MM10-03	1	20	3	13.5	13.6	49	30	15	17.8	17°	M10	0.06	With	LN*U03...
HXN03R020MM10-04	1	20	4	13.5	13.6	49	30	15	17.8	17°	M10	0.06	With	LN*U03...
HXN03R022MM10-03	1	22	3	15.5	15.6	49	30	15	17.8	17°	M10	0.06	With	LN*U03...
HXN03R022MM10-04	1	22	4	15.5	15.6	49	30	15	17.8	17°	M10	0.07	With	LN*U03...
HXN03R025MM12-04	1	25	4	18.5	18.6	57	35	17	20.8	17°	M12	0.1	With	LN*U03...
HXN03R025MM12-05	1	25	5	18.5	18.6	57	35	17	20.8	17°	M12	0.11	With	LN*U03...
HXN03R028MM12-04	1	28	4	21.5	21.6	57	35	17	23	17°	M12	0.12	With	LN*U03...
HXN03R028MM12-05	1	28	5	21.5	21.6	57	35	17	23	17°	M12	0.12	With	LN*U03...
HXN03R030MM16-04	1	30	4	23.5	23.6	63	40	22	28.8	17°	M16	0.19	With	LN*U03...
HXN03R030MM16-05	1	30	5	23.5	23.6	63	40	22	28.8	17°	M16	0.2	With	LN*U03...
HXN03R032MM16-05	1	32	5	25.5	25.6	63	40	22	28.8	17°	M16	0.2	With	LN*U03...
HXN03R032MM16-06	1	32	6	25.5	25.6	63	40	22	28.8	17°	M16	0.21	With	LN*U03...

SPARE PARTS

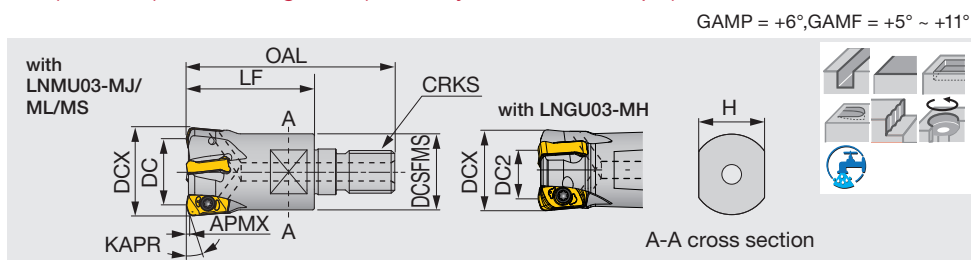


Designation	Clamping screw	Lubricant	Wrench
HXN03...	CSPB-2.5	M-1000	IP-8D

*Recommended clamping torque : CSPB-2.5=1.3 N-m

HXN03-C

Super high feed milling endmills (Dofeed) with TungFlex (Directly to the tool tips)



Metric	APMX	DCX	CICT	DC	DC2	OAL	LF	H	DCSFMS	KAPR	CRKS	WT(kg)	Air hole	Insert
HXN03R016MM08-02-C	1	16	2	9.6	9.8	42	25	10	12.8	15°	M8	0.03	With	LN*U03...
HXN03R020MM10-03-C	1	20	3	13.5	13.6	49	30	15	17.8	17°	M10	0.06	With	LN*U03...
HXN03R020MM10-04-C	1	20	4	13.5	13.6	49	30	15	17.8	17°	M10	0.06	With	LN*U03...
HXN03R025MM12-04-C	1	25	4	18.5	18.6	57	35	17	20.8	17°	M12	0.1	With	LN*U03...
HXN03R025MM12-05-C	1	25	5	18.5	18.6	57	35	17	20.8	17°	M12	0.1	With	LN*U03...
HXN03R032MM16-05-C	1	32	5	25.5	25.6	63	40	22	28.8	17°	M16	0.2	With	LN*U03...
HXN03R032MM16-06-C	1	32	6	25.5	25.6	63	40	22	28.8	17°	M16	0.2	With	LN*U03...
HXN03R040MM16-06-C	1	40	6	33.6	33.7	63	40	22	28.8	17°	M16	0.27	With	LN*U03...

SPARE PARTS

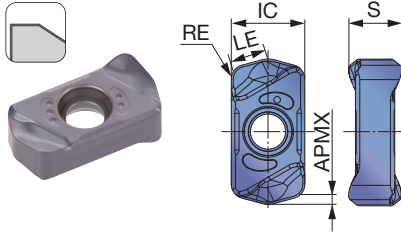


Designation	Clamping screw	Lubricant	Wrench
HXN03...	CSPB-2.5	M-1000	IP-8D

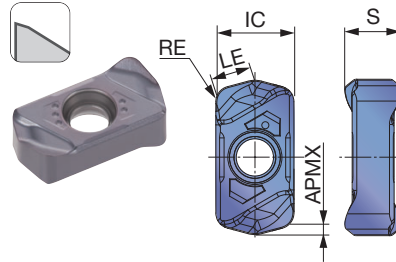
*Recommended clamping torque : CSPB-2.5=1.3 N-m

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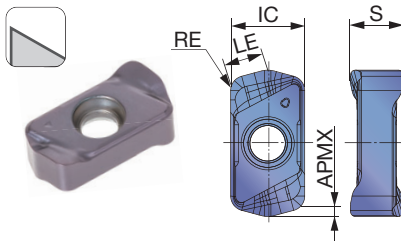
LNMU03-MJ (General purpose)



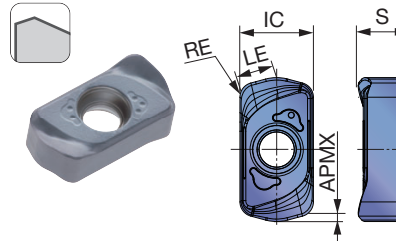
LNMU03-ML (Low cutting force)



LNMU03-MS (For stainless steel)



LNGU03-MH (Reinforced cutting edge)



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

★ : First choice
☆ : Second choice

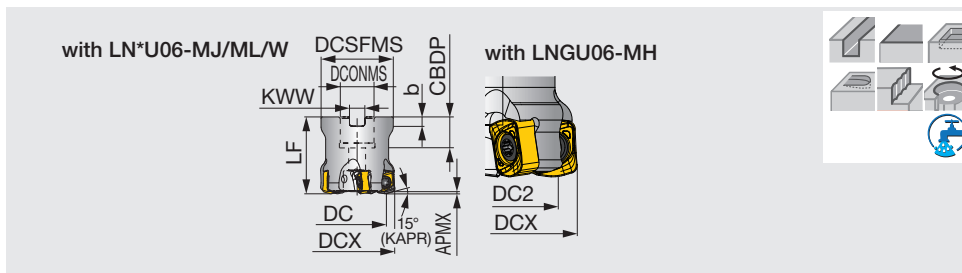
Designation	RE	APMX	Coated						LE	IC	S
			AH130	AH3225	AH3035	AH725	AH8015	AH8005			
LNMU0303ZER-MJ	0.047	0.039	●	●	●	●	●	●	0.126	0.236	0.169
LNMU0303ZER-ML	0.047	0.039	●	●	●	●	●	●	0.126	0.236	0.169
LNMU0303ZER-MS	0.047	0.039	●	●					0.126	0.236	0.169
LNGU0303ZER-MH	0.047	0.039					●	●	0.126	0.236	0.169

● : New
● : Line up

TXN06

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

GAMP = +10°, GAMF = +2° ~ +6°



Inch	APMX	DCX	CICT	DC	DC2	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(lb)	Air hole	Insert
TXN06R200U0075A04	0.059	2.000	4	1.513	1.485	1.850	1.969	0.750	0.750	0.315	0.197	0.970	With	LN*U06...
TXN06R200U0075A05	0.059	2.000	5	1.513	1.485	1.850	1.969	0.750	0.750	0.315	0.197	0.990	With	LN*U06...
TXN06R250U0075A04	0.059	2.500	4	2.012	1.983	2.323	1.969	0.750	0.750	0.315	0.197	1.740	With	LN*U06...
TXN06R250U0075A06	0.059	2.500	6	2.012	1.983	2.323	1.969	0.750	0.750	0.315	0.197	1.760	With	LN*U06...
TXN06R300U0100A05	0.059	3.000	5	2.512	2.481	2.835	2.480	1.000	1.049	0.374	0.236	3.130	With	LN*U06...
TXN06R300U0100A07	0.059	3.000	7	2.512	2.481	2.835	2.480	1.000	1.049	0.374	0.236	3.280	With	LN*U06...
TXN06R400U0150A06	0.059	4.000	6	3.512	3.481	3.819	2.480	1.500	1.610	0.626	0.394	4.850	With	LN*U06...
TXN06R400U0150A10	0.059	4.000	10	3.512	3.481	3.819	2.480	1.500	1.610	0.626	0.394	4.850	With	LN*U06...
TXN06R500U0150A08	0.059	5.000	8	4.512	4.481	3.819	2.480	1.500	1.610	0.626	0.394	7.050	With	LN*U06...
TXN06R500U0150A12	0.059	5.000	12	4.512	4.481	3.819	2.480	1.500	1.610	0.626	0.394	7.280	With	LN*U06...
TXN06R600U0200A10	0.059	6.000	10	5.512	5.480	4.331	2.480	2.000	1.496	0.748	0.433	9.480	With	LN*U06...
TXN06R600U0200A14	0.059	6.000	14	5.512	5.480	4.331	2.480	2.000	1.496	0.748	0.433	9.260	With	LN*U06...

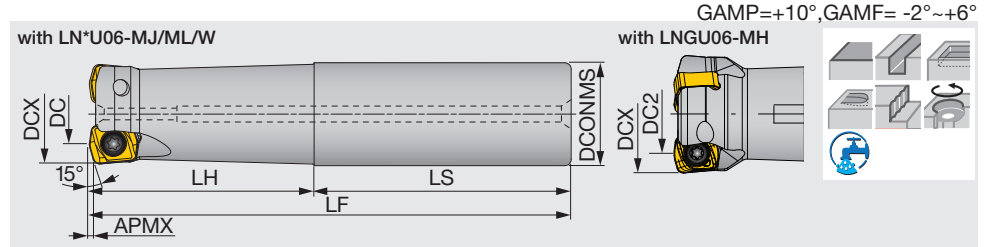
SPARE PARTS

Designation	Clamping screw	Grip	Lubricant	Torx bit
TXN06R200U - 500U	CSPB-5	H-TB2W	M-1000	BLDIP20/S7
TXN06R600U...	CSPB-5	H-TB2W	M-1000	BLDIP20/M7

*Recommended clamping torque: CSPB-5=3.69 lbf-ft

EXN06

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



Inch	APMX	DCX	CICT	DC	DC2	DCONMS	LF	LH	LS	WT(lb)	Air hole	Insert
EXN06R125U0125W02	0.059	1.250	2	0.766	0.745	1.250	5.281	3.000	2.281	1.540	With	LN*U06...
EXN06R125U0125-02L	0.059	1.250	2	0.766	0.745	1.250	8.000	5.000	3.000	2.360	With	LN*U06...
EXN06R150U0125W03	0.059	1.500	3	1.014	0.989	1.250	5.781	3.500	2.281	1.830	With	LN*U06...
EXN06R150U0125-03L	0.059	1.500	3	1.014	0.989	1.250	10.000	2.000	8.000	3.310	With	LN*U06...

SPARE PARTS

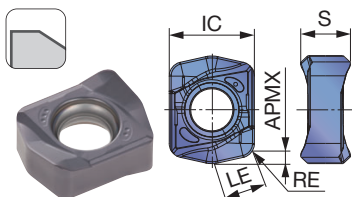


Designation	Clamping screw	Lubricant	Wrench
EXN06	CSPB-5	M-1000	IP-20D

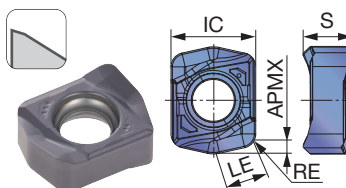
*Recommended clamping torque: CSPB-5=3.69 lbf-ft

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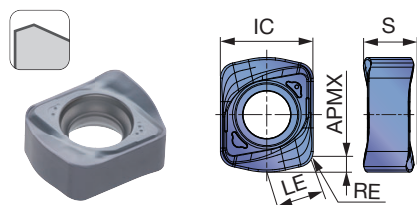
LNMU06-MJ



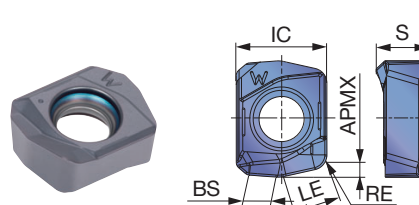
LNMU06-ML



LNGU06-MH



LNGU06-W (2 corners)



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

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated							LE	IC	S	BS
			AH130	AH3225	AH3035	AH725	AH120	AH8015	AH8005				
LNMU06X5ZER-MJ	0.079	0.059	●	●	●	●	●	●		0.236	0.472	0.276	-
LNMU06X5ZER-ML	0.079	0.059	●	●	●	●	●	●		0.236	0.472	0.276	-
LNGU06X5ZER-MH	0.079	0.059						●	●	0.236	0.472	0.276	-
LNGU06X5ZER-W	0.079	0.059				●				0.236	0.472	0.276	0.142

● : New
● : Line up

STANDARD CUTTING CONDITIONS TXN03/EXN03/HXN03

ISO	Workpiece material	Hardness	Priority	Grade	Chip-breaker	Cutting speed Vc (sfm)	Feed per tooth: fz (ipt)			Tool dia.: DCX (in)						
							ø0.625-ø0.875		Plunging	ø0.625", CICT = 2		ø0.688", CICT = 2		ø0.75		
							ø0.625-ø0.875	ø1.000-ø2.000		n	Vf	n	Vf	n	Vf	
P	Carbon steels (S45C / C45, S55C / C55, etc.)	- 300HB	First choice	AH3225	MJ	330 - 980	0.020 - 0.020	0.020 - 0.059	0.004	4,030	250	3,660	227	3,360	208	312
	Alloy steels (SCM440 / 42CrMo4, etc.)	- 300HB	First choice	AH3225	MJ	330 - 980	0.020 - 0.047	0.020 - 0.059	0.004	4,030	250	3,660	227	3,360	208	312
	Prehardened steels (NAK80, PX5, etc.)	30 - 40HRC	First choice	AH3225	MJ	330 - 660	0.020 - 0.039	0.020 - 0.039	0.004	2,990	167	2,720	152	2,500	140	210
		30 - 40HRC	for wear resistance	AH8015	MJ	330 - 660	0.020 - 0.039	0.020 - 0.039	0.004	2,990	167	2,720	152	2,500	140	210
M	Austenitic stainless steels (SUS304 / X5CrNi18-9, etc.)	- 200HB	First choice	AH130	MS	260 - 490	0.012 - 0.031	0.012 - 0.031	0.004	2,380	95	2,170	87	1,990	80	119
		28HRC - (H1150)	First choice for wear resistance	AH130	MS	260 - 490	0.008 - 0.020	0.008 - 0.020	0.004	2,380	57	2,170	52	1,990	48	72
	Precipitation hardening stainless steels (SUS630 / X5CrNiCuNb16-4)	40HRC - (H900)	First choice for impact resistance	AH3035	ML	260 - 390	0.004 - 0.012	0.004 - 0.012	0.004	2,020	32	1,830	29	1,680	27	40
		40HRC - (H900)	for impact resistance	AH3035	MJ	260 - 390	0.004 - 0.012	0.004 - 0.012	0.004	2,020	32	1,830	29	1,680	27	40
K	Gray cast irons (FC250 / GG25 / 250, etc.)	150 - 250HB	First choice	AH725	MJ	330 - 980	0.020 - 0.047	0.020 - 0.059	0.004	4,030	250	3,660	227	3,360	208	312
	Ductile cast irons (FCD400, etc.)	150 - 250HB	First choice	AH725	MJ	260 - 660	0.020 - 0.047	0.020 - 0.059	0.004	2,990	185	2,720	169	2,500	155	233
S	Titanium alloy (Ti-6Al-4V, etc.)	- 40HRC	First choice for impact resistance	AH130	ML	100 - 200	0.012 - 0.028	0.012 - 0.028	0.003	790	25	720	23	660	21	32
		- 40HRC	for impact resistance	AH130	MJ	100 - 200	0.012 - 0.028	0.012 - 0.028	0.003	790	25	720	23	660	21	32
	Heat-resistant alloy (Inconel, Hastelloy, etc.)	- 40HRC	First choice for impact resistance	AH8015	ML	70 - 160	0.004 - 0.012	0.004 - 0.012	0.002	610	10	560	9	510	8	12
H	Hot mold steel (SKD61 / X40CrMoV5-1, etc.)	40 - 55HRC	First choice	AH8015	MH	260 - 490	0.004 - 0.020	0.004 - 0.020	0.002	2,390	57	2,170	52	1,990	48	72
		40 - 55HRC	Low resistance	AH8015	MJ		0.004 - 0.012	0.004 - 0.012								
	Hot mold steel of D.T.C materials (DAC**, DH**, DIEVER, etc.)	40 - 55HRC	First choice for impact resistance	AH8015	MJ	160 - 330	0.004 - 0.012	0.004 - 0.012	0.002	1,590	25	1,440	23	1,320	21	32
		40 - 55HRC	for impact resistance	AH8015	MH		0.004 - 0.020	0.004 - 0.020								
		55 - 60HRC	First choice	AH8005	MH		160 - 230	0.002 - 0.008								
Cold mold steels (SKD11 / X153CrMoV12, etc.)	55 - 60HRC	First choice	AH8005	MH	160 - 230	0.002 - 0.008	0.001 - 0.004	0.001	1,220	12	1,110	11	1,020	10	15	
	55 - 60HRC	for impact resistance	AH8015	MH	160 - 230	0.001 - 0.004	0.002 - 0.008	0.001	1,220	5	1,110	4	1,020	4	6	

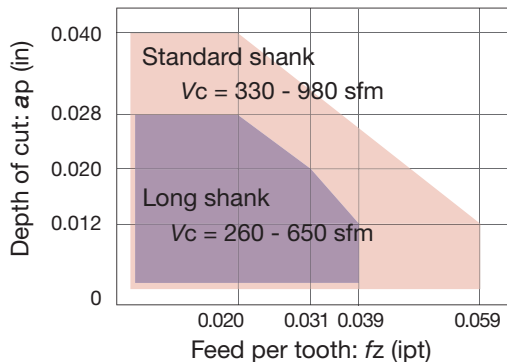
- When chips stay in the cutting zone during slotting or pocketing, use air blast to remove chips from the work area.

- 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

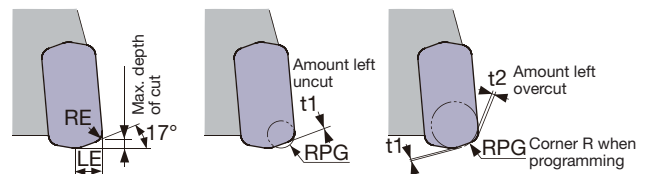
When using a long shank, please lower the cutting conditions (Vc, fz, ap) to 70% of the maximum conditions for the standard shank.



Tool dia.: DCX = ø0.625" - 1.250"
Workpiece: 1015 (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 = 0.060". If a larger radius is used, overcutting will occur. The following table shows the amount left uncut (t1) and overcut (t2).



LNMU03-MJ/ML

Max. depth of cut APMX (in)	Corner radius RE (in)	LE (in)	Corner R when programming: RPG	Amount left uncut t ¹ (in)	Amount left overcut t ² (in)
0.039	0.047	0.118	0.039	0.018	-
0.039	0.047	0.118	0.060	0.014	-
0.039	0.047	0.118	0.079	0.008	0.004
0.039	0.047	0.118	0.098	0.003	0.011

LNGU03-MH

Max. depth of cut APMX (in)	Corner radius RE (in)	LE (in)	Corner R when programming: RPG	Amount left uncut t ¹ (in)	Amount left overcut t ² (in)
0.039	0.047	0.118	0.039	0.018	-
0.039	0.047	0.118	0.060	0.014	-
0.039	0.047	0.118	0.079	0.008	0.004
0.039	0.047	0.118	0.098	0.003	0.011

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

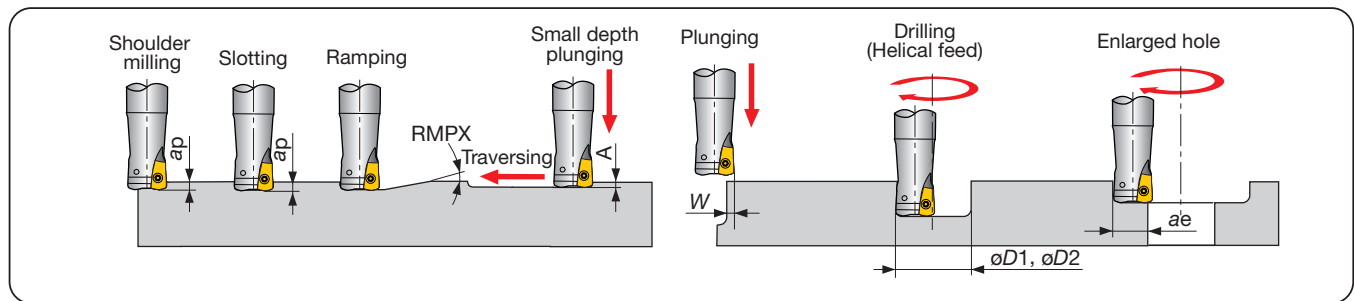
Tool dia.: DCX (in), Number of revolutions: n (rpm), Feed speed: Vf (ipm), Max. depth of cut: ap = 0.004"

ø0.875			ø1			ø1.125			ø1.25			ø1.5			ø2			
n	Vf		n	Vf		n	Vf		n	Vf		n	Vf		n	Vf		
	CICT=2	CICT=3		CICT=4	CICT=5		CICT=4	CICT=5		CICT=5	CICT=6		CICT=5	CICT=6		CICT=5	CICT=8	CICT=10
2,880	230	346	2,520	403	504	2,240	358	448	2,020	404	485	1,680	336	403	1,260	252	403	504
Vc = 660 sfm, fz = 0.04 ipt																		
2,880	230	346	2,520	403	504	2,240	358	448	2,020	404	485	1,680	336	403	1,260	252	403	504
Vc = 660 sfm, fz = 0.04 ipt																		
2,140	120	180	1,870	209	262	1,660	186	232	1,500	210	252	1,250	175	210	940	132	211	263
Vc = 490 sfm, fz = 0.028 ipt																		
2,140	120	180	1,870	209	262	1,660	186	232	1,500	210	252	1,250	175	210	940	132	211	263
Vc = 490 sfm, fz = 0.028 ipt																		
1,700	68	102	1,490	119	149	1,320	106	132	1,190	119	143	990	99	119	740	74	118	148
Vc = 390 sfm, fz = 0.02 ipt																		
1,700	41	61	1,490	72	89	1,320	63	79	1,190	71	86	990	59	71	740	44	71	89
Vc = 390 sfm, fz = 0.012 ipt																		
1,440	23	35	1,260	40	50	1,120	36	45	1,010	40	48	840	34	40	630	25	40	50
Vc = 330 sfm, fz = 0.008 ipt																		
2,880	230	346	2,520	403	504	2,240	358	448	2,020	404	485	1,680	336	403	1,260	252	403	504
Vc = 660 sfm, fz = 0.04 ipt																		
2,140	171	257	1,870	299	374	1,660	266	332	1,500	300	360	1,250	250	300	940	188	301	376
Vc = 490 sfm, fz = 0.04 ipt																		
570	23	34	500	40	50	440	35	44	400	40	48	330	33	40	250	25	40	50
Vc = 130 sfm, fz = 0.02 ipt																		
440	7	11	380	12	15	340	11	14	310	12	15	250	10	12	190	8	12	15
Vc = 100 sfm, fz = 0.008 ipt																		
1,700	41	61	1,490	72	89	1,320	63	79	1,190	71	86	990	59	71	740	44	71	89
Vc = 390 sfm, fz = 0.012 ipt																		
1,140	18	27	990	32	40	880	28	35	790	32	38	660	26	32	500	20	32	40
Vc = 260 sfm, fz = 0.008 ipt																		
870	7	10	760	12	15	680	11	14	610	12	15	510	10	12	380	8	12	15
Vc = 200 sfm, fz = 0.004 ipt																		
870	3	5	760	6	8	680	5	7	610	6	7	510	5	6	380	4	6	8
Vc = 200 sfm, fz = 0.002 ipt																		

- 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



Inch	Tool dia. DCX	Max. depth of cut APMX	Max. ramping angle RMPX	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
EXN03R062U0062...	0.625	0.039	1.7	0.012	0.118	0.897	1.181	0.492
EXN03R068U0062...	0.688	0.039	1.7	0.012	0.118	0.991	1.339	0.571
EXN03R075U0075...	0.750	0.039	1.2	0.012	0.118	1.132	1.496	0.650
EXN03R087U0075...	0.875	0.039	1	0.012	0.118	1.371	1.654	0.728
EXN03R100U0100...	1.000	0.039	0.9	0.012	0.118	1.610	1.890	0.846
EXN03R112U0100...	1.125	0.039	0.8	0.012	0.118	1.857	2.126	0.965
EXN03R125U0125...	1.250	0.039	0.7	0.012	0.118	2.104	2.441	1.122
TXN03R150U0075...	1.500	0.039	0.5	0.012	0.118	2.750	3.070	1.437
TXN03R200U0075...	2.000	0.039	0.4	0.012	0.118	3.540	3.858	1.830

- For DCX above ø1.300", slot milling, ramping or contouring is not recommended as chips may be re-cut.

STANDARD CUTTING CONDITIONS TXN06 / EXN06

ISO	Workpiece material	Hardness	Priority	Grade	Chip-breaker	Cutting speed Vc (sfm)	Feed per tooth: fz (ipt)		ø1.25", CICT = 2		ø1.5", CICT = 3	
							Tool dia.: DCX (in) ø1.25" ~ ø6"	Plunging	n	Vf	n	Vf
P	Carbon steels (S45C / C45, S55C / C55, etc.)	- 300HB	First choice	AH3225	MJ	330 - 980	0.020 - 0.059	0.006	2,020	162	1,680	202
	Alloy steels (SCM440 / 42CrMo4, etc.)	- 300HB	First choice	AH3225	MJ	330 - 660	0.020 - 0.059	0.006	2,020	162	1,680	202
	Prehardened steels (NAK80, PX5, etc.)	30 - 40HRC	First choice	AH3225	MJ	330 - 660	0.020 - 0.047	0.006	1,500	93	1,250	116
M	Stainless steels (SUS304 / X5CrNi18-9, etc.)	- 200HB	First choice	AH130	ML	260 - 490	0.012 - 0.031	0.004	1,190	57	990	71
		28HRC	First choice	AH130	MS	260 - 490	0.008 - 0.020	0.004	1,190	29	990	36
	Precipitation hardening stainless steels (SUS630 / X5CrNi-CuNb16-4)	(H1150)	for wear resistance	AH3225	MS	260 - 490	0.008 - 0.020	0.004	1,190	29	990	36
		40HRC - (H900)	for impact resistance	AH3035	ML	260 - 390	0.004 - 0.012	0.004	1,010	16	840	20
	Gray cast irons (FC250 / GG25 / 250, etc.)	150 - 250HB	First choice	AH120	MJ	330 - 980	0.020 - 0.059	0.006	2,020	162	1,680	202
		150 - 250HB	First choice	AH120	MJ	260 - 660	0.020 - 0.059	0.006	1,500	120	1,250	150
S	Titanium alloy (Ti-6Al-4V, etc.)	- 40HRC	First choice	AH130	ML	100 - 200	0.012 - 0.028	0.003	400	16	330	20
			for impact resistance	AH130	MJ	100 - 200	0.012 - 0.028	0.003	400	16	330	20
	Heat-resistant alloy (Inconel, Hastelloy, etc.)	- 40HRC	First choice	AH8015	ML	70 - 160	0.004 - 0.012	0.002	310	5	250	6
H	Hot mold steel (SKD61 / X40CrMoV5-1, etc.)	40 - 55HRC	First choice	AH8015	MH	260 - 490	0.004 - 0.020	0.002	1,190	29	990	36
			Low resistance	AH8015	MJ	260 - 490	0.004 - 0.012	0.002	1,190	29	990	36
	Hot mold steel of D.T.C materials (DAC**, DH**, DIEVER, etc)	40 - 55HRC	First choice	AH8015	MJ	160 - 330	0.004 - 0.012	0.002	790	13	660	16
			for impact resistance	AH8015	MH	160 - 330	0.004 - 0.020	0.002	790	13	660	16
	Cold mold steels (SKD11 / X153CrMoV12, etc.)	55 - 60HRC	First choice	AH8005	MH	160 - 230	0.002 - 0.012	0.001	610	5	510	6
55 - 60HRC		for impact resistance	AH8015	MH	160 - 230	0.002 - 0.012	0.001	610	2	510	3	

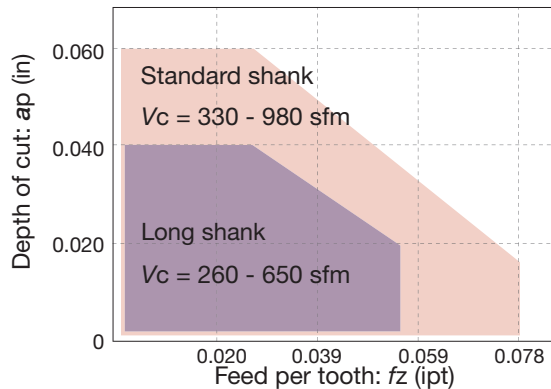
The above table shows the conditions for standard shank type cutters. When using long shank type cutters, the number of teeth may be different. In this case, the cutting conditions should be changed by referring to: "The usage of standard and long shanks" shown in previous page.

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

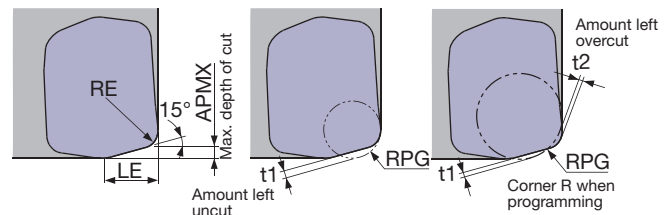
When using a long shank, please lower the cutting conditions (Vc, fz, ap) to 70% of the maximum conditions for the standard shank.



Tool dia.: DCX = ø1.250" - 1.500"
Workpiece: 1055 (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 = 0.118". If a larger radius is used, overcutting will occur. The following table shows the amount left uncut (t1) and overcut (t2).



LNMU06-MJ/ML

Max. depth of cut APMX (in)	Corner radius RE	LE (in)	Corner R when programming: RPG	Amount left uncut t ¹ (in)	Amount left overcut t ² (in)
0.059	0.079	0.236	0.079	0.039	-
			0.118	0.030	-
			0.157	0.021	0.010

LNGU06-MH

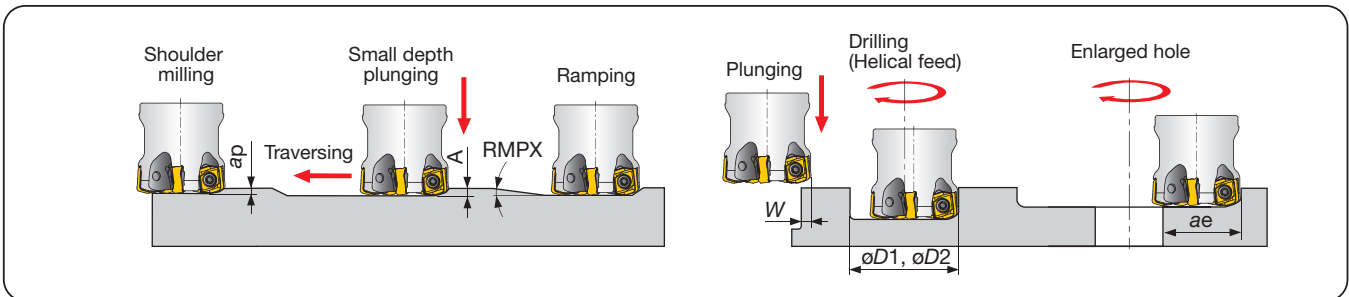
Max. depth of cut APMX (in)	Corner radius RE	LE (in)	Corner R when programming: RPG	Amount left uncut t ¹ (in)	Amount left overcut t ² (in)
0.059	0.079	0.236	0.079	0.035	-
			0.118	0.026	-
			0.157	0.016	0.010

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

Tool dia.: DCX (mm), Number of revolutions: n (min⁻¹), Feed speed: V_f (mm/min), Max. depth of cut: $ap = 1.5$ mm, Number of teeth: CICT

$\phi 2''$			$\phi 2.5''$			$\phi 3''$			$\phi 4''$			$\phi 5''$			$\phi 6''$		
n	V_f CICT = 4	V_f CICT = 5	n	V_f CICT = 4	V_f CICT = 6	n	V_f CICT = 5	V_f CICT = 7	n	V_f CICT = 6	V_f CICT = 10	n	V_f CICT = 8	V_f CICT = 12	n	V_f CICT = 10	V_f CICT = 14
1,260	202	252	1,010	162	242	840	168	235	630	151	252	500	160	240	420	168	235
$V_c = 660$ sfm, $f_z = 0.040$ ipt																	
1,260	202	252	1,010	162	242	840	168	235	630	151	252	500	160	240	420	168	235
$V_c = 660$ sfm, $f_z = 0.040$ ipt																	
940	117	146	750	93	140	620	96	135	470	87	146	370	92	138	310	96	135
$V_c = 490$ sfm, $f_z = 0.031$ ipt																	
940	150	188	750	120	180	620	124	174	470	113	188	370	118	178	310	124	174
$V_c = 490$ sfm, $f_z = 0.040$ ipt																	
740	71	89	600	58	86	500	60	84	370	53	89	300	58	86	250	60	84
$V_c = 390$ sfm, $f_z = 0.024$ ipt																	
740	36	44	600	29	43	500	30	42	370	27	44	300	29	43	250	30	42
$V_c = 390$ sfm, $f_z = 0.012$ ipt																	
630	20	25	500	16	24	420	17	24	320	15	26	250	16	24	210	17	24
$V_c = 330$ sfm, $f_z = 0.008$ ipt																	
1,260	202	252	1,010	162	242	840	168	235	630	151	252	500	160	240	420	168	235
$V_c = 660$ sfm, $f_z = 0.040$ ipt																	
940	150	188	750	120	180	620	124	174	470	113	188	370	118	178	310	124	174
$V_c = 490$ sfm, $f_z = 0.040$ ipt																	
250	20	25	200	16	24	170	17	24	120	14	24	100	16	24	80	16	22
$V_c = 130$ sfm, $f_z = 0.020$ ipt																	
190	6	8	150	5	7	130	5	7	100	5	8	80	5	8	60	5	7
$V_c = 100$ sfm, $f_z = 0.008$ ipt																	
740	36	44	600	29	43	500	30	42	370	27	44	300	29	43	250	30	42
$V_c = 390$ sfm, $f_z = 0.012$ ipt																	
500	16	20	400	13	19	330	13	18	250	12	20	200	13	19	170	14	19
$V_c = 260$ sfm, $f_z = 0.008$ ipt																	
380	6	8	310	5	7	250	5	7	190	5	8	150	5	7	130	5	7
$V_c = 200$ sfm, $f_z = 0.004$ ipt																	
380	3	4	310	2	4	250	3	4	190	2	4	150	2	4	130	3	4
$V_c = 200$ sfm, $f_z = 0.002$ ipt																	

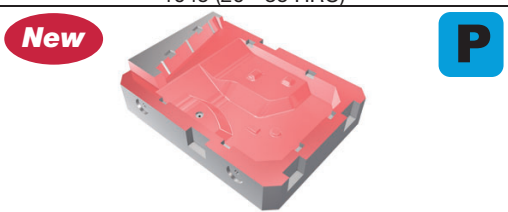
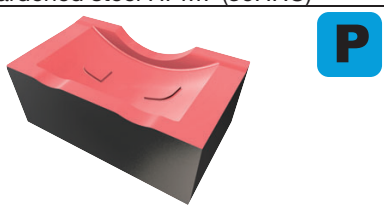
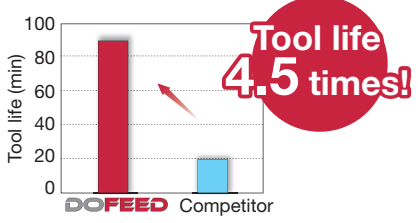
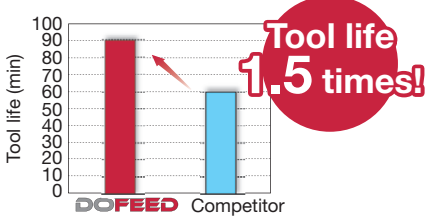
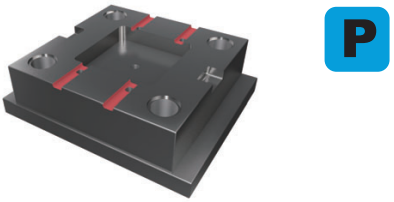
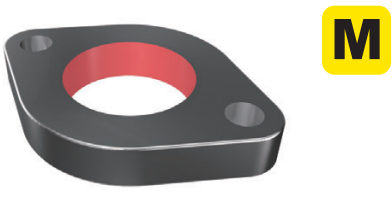
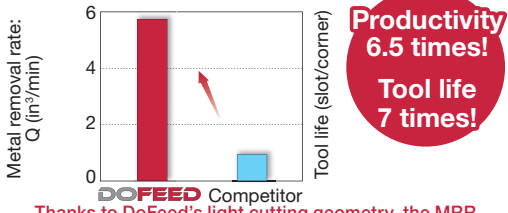
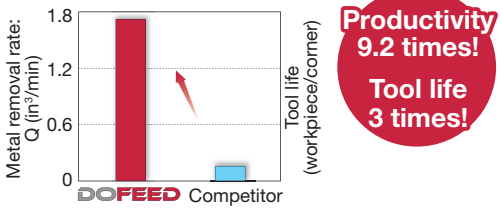
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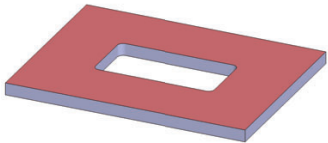
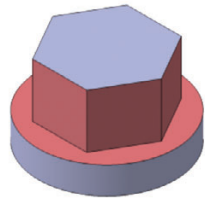
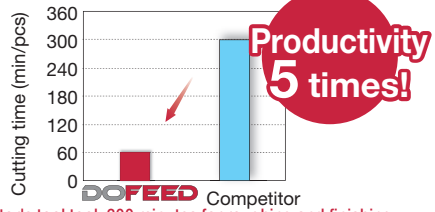
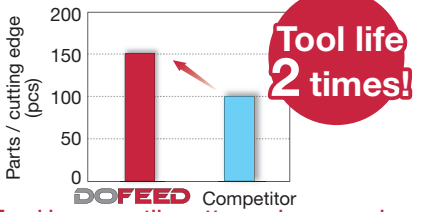
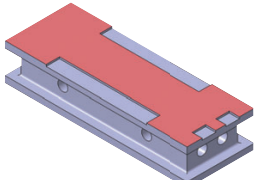
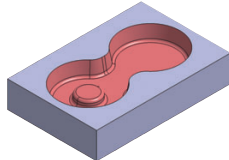
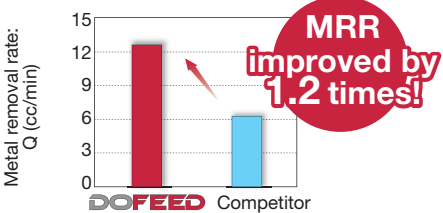



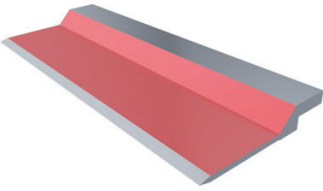

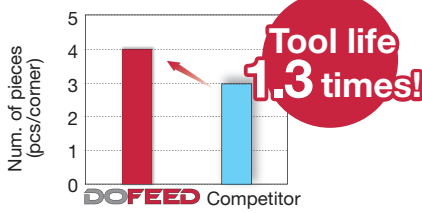
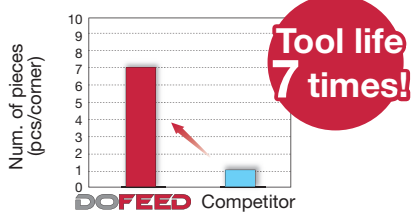
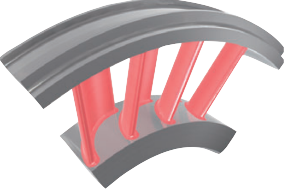
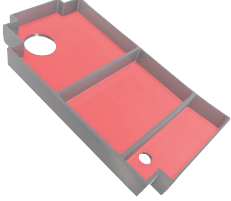
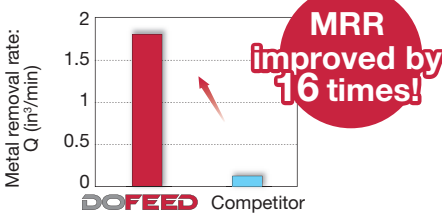
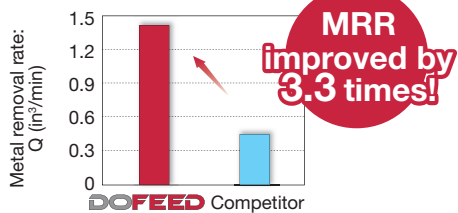
Inch	Tool dia. DCX	Max. depth of cut APMX	Max. ramping angle RMPX	Max. plunging depth A	Max. cutting width in plunging W	Min. machinable hole dia. øD1	Max. machinable hole dia. øD2	Max. cutting width in enlarged hole ae
EXN06R125U...	ø1.250	0.059	2.0°	0.020	0.236	1.830	2.300	0.970
EXN06R150U...	ø1.500	0.059	1.5°	0.020	0.236	2.330	2.800	1.220
TXN06R200U...	ø2.000	0.059	0.9°	0.020	0.236	3.330	3.800	1.720
TXN06R250U...	ø2.500	0.059	0.6°	0.020	0.236	4.330	4.800	2.220
TXN06R300U...	ø3.000	0.059	0.5°	0.020	0.236	5.330	5.800	2.720

· For DCX above 4.000", slot milling, ramping or contouring is not recommended as chips may be re-cut.

PRACTICAL EXAMPLES

Workpiece type		Die & Mold	Die & Mold / Back block
Cutter		TXN06R250U0075A04 ($\phi 2.500"$, $z = 4$)	TXN06R250U0075A06 ($\phi 2.500"$, $z = 6$)
Insert		LNMU06X5ZER-MJ	LNMU06X5ZER-MJ
Grade		AH3225	AH3035
		1045 (20 - 35 HRC)	Prehardened steel HPM7 (30HRC)
Workpiece material			
Cutting conditions	Cutting speed: V_c (sfm)	650	380
	Feed per tooth: f_z (ipt)	0.059	0.028
	Depth of cut: ap (in)	0.030	0.043
	Width of cut: ae (in)	1.8	1.7
	Process	Contouring	Contour milling
	Coolant	Dry	Air blow
	Machine	Vertical M/C, CAT50	Vertical M/C, CAT50
Results		 <p>AH3225 reduced the damage of the bottom cutting edge, extending tool life by 4.5 times.</p>	 <p>AH3035 grade showed better chipping resistance than competitor improving tool life by 50%.</p>
Workpiece type		Mold base	Flange
Cutter		EXN03R100U0100-05 ($\phi 1.000"$, $z = 5$)	EXN03R100U0100-04 ($\phi 1.000"$, $z = 4$)
Insert		LNMU0303ZER-MJ	LNMU0303ZER-MJ
Grade		AH725	AH725
		SC360 (Cast steel)	S34700 (Heat resistant stainless steel)
Workpiece material			
Cutting conditions	Cutting speed: V_c (sfm)	460	720
	Feed per tooth: f_z (ipt)	0.019	0.008
	Depth of cut: ap (in)	0.035	0.020
	Width of cut: ae (in)	1.000	1.000
	Process	Slot milling	Helical interpolation
	Coolant	Dry	Wet
	Machine	Horizontal M/C, CAT50	Vertical M/C
Results		 <p>Thanks to DoFeed's light cutting geometry, the MRR has improved by 650%, while maintaining the same level of, or even reduced, spindle load as the competitor's tool. Chip re-cutting has significantly reduced, while increasing the tool life by seven times.</p>	 <p>Thanks to its low cutting geometry, DoFeed has improved the MRR even in the weak fixture setting. Insert life has tripled even in high speed milling, while significantly reducing insert fractures induced by thermal cracking.</p>

Workpiece type		Machine frame	Automotive / Rod end
Cutter		TXN06R300U0100A07 (ø3.000", z = 7)	EXN03R125U0125-06-C (ø1.250", z = 6)
Insert		LNMU06X5ZER-ML x 6 / LNGU06X5ZER-W x 1	LNMU0303ZER-MS
Grade		AH130 / AH725	AH130
Workpiece material		S30400	S17400
		 M	 M
Cutting conditions	Cutting speed: V_c (sfm)	330	390
	Feed per tooth: f_z (ipt)	0.016	0.020
	Feed speed: V_f (in)	51	142
	Depth of cut: a_p (in)	0.020	0.028
	Width of cut: a_e (in)	2.25	~078
	Process	Face milling	Face milling
	Coolant	Wet	Internal supply
Machine	Vertical M/C, CAT50	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 & Mold
Cutter		TXN06R600U0200A14 (ø6.000", z = 14)	HXN03R020MM10-04 (ø0.787", z = 4)
Insert		LNMU06X5ZER-MJ	LNMU0303ZER-MJ
Grade		AH120	AH725
Workpiece material		80-55-06	80-55-06
		 K	 K
Cutting conditions	Cutting speed: V_c (sfm)	500	620
	Feed per tooth: f_z (ipt)	0.040	0.016
	Depth of cut: a_p (in)	0.020	0.012
	Width of cut: a_e (in)	4.700	0.354
	Process	Face milling	Pocket milling
	Coolant	Dry	Dry (air)
	Machine	Horizontal M/C, CAT50	Vertical M/C, CAT40
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.	

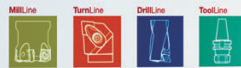
Workpiece type		Press-cutter blade	Machine part
Cutter		TXN06R250U0075A06 ($\phi 2.500''$, $z = 6$)	EXN03R125U0125-06 ($\phi 1.250''$, $z = 6$)
Insert		LNGU06X5ZER-MH	LNMU0303ZER-MJ
Grade		AH8015 4140(44HRC)	AH8015 4140(44HRC)
Workpiece material		 H	 H
Cutting conditions	Cutting speed: V_c (sfm)	390	560
	Feed per tooth: f_z (ipt)	0.031	0.031
	Depth of cut: a_p (in)	0.031	0.036
	Width of cut: a_e (in)	1.5	0.93
	Process	Face milling	Pocketing
	Coolant	Dry (air)	Air blast
	Machine	Vertical M/C	Vertical M/C
Results		 <p>A combination of the MH chipbreaker and AH8015 reduced chipping and wear. Tool life has increased to 130%.</p>	 <p>AH8015 exhibited superior wear resistance, improving the tool life by 7 times over the competitor.</p>
Workpiece type		Turbine blade	Aerospace component
Cutter		EXN03R112U0100-05 ($\phi 1.125''$, $z = 5$)	EXN03R100U0100-05 ($\phi 1.000''$, $z = 5$)
Insert		LNMU0303ZER-ML	LNMU0303ZER-ML
Grade		AH725	AH725
Workpiece material		Heat resistant cast steel  S	Ti-6Al-4V (36HRC)  S
Cutting conditions	Cutting speed: V_c (sfm)	230	160
	Feed per tooth: f_z (ipt)	0.020	0.028
	Depth of cut: a_p (in)	0.020	0.020
	Width of cut: a_e (in)	1.125	1.000
	Process	Shoulder milling	Pocket milling
	Coolant	Wet	Wet
	Machine	Vertical M/C, CAT50	Vertical M/C, CAT40
Results		 <p>Tripled cutting speed and super high feed milling offers 16 times higher productivity.</p>	 <p>7.3 times higher feed machining that drastically improves productivity.</p>

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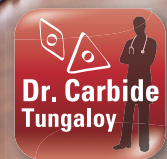


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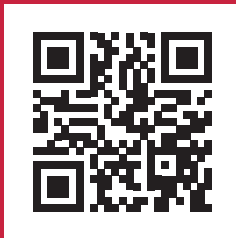
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