

MILLLINE Super high feed cutter
DOFEEDMINI

NEW!

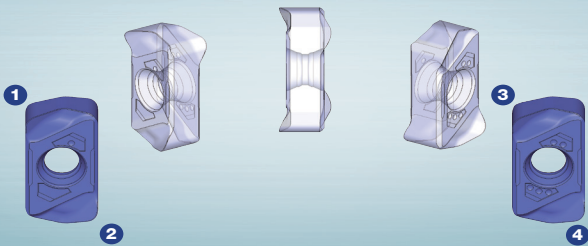
Highly efficient milling tools for mid to small range machines



DOFEEDMINI

- The next generation of super high feed milling cutters

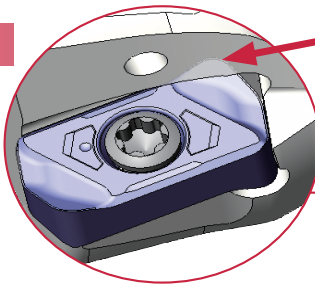
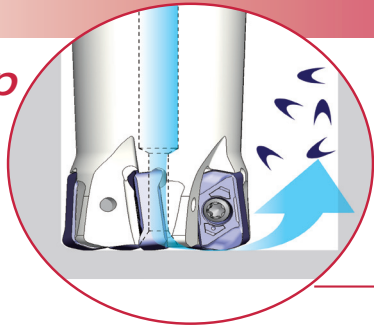
Highly efficient milling tools for mid to small range machines



- Suitable for high feed milling on small and mid size machines with remarkable anti-chatter characteristics. Exceptional machining efficiency!
- Economical insert with 4 cutting edges!

Features

Excellent chip evacuation with air hole



Protection for unused edge of insert

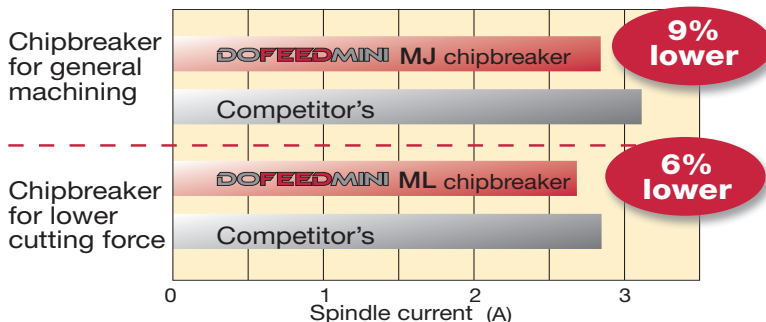


High density for efficient machining

Tool ϕ	No. of inserts		Efficiency machining Comparison with competitor
	DOFEEDMINI	Competitor	
$\phi 0.625$	2	2	1.0 times
$\phi 0.750$	3	3	1.0 times
$\phi 1.000$	5	4	1.3 times
$\phi 1.125$	5	4	1.3 times
$\phi 1.250$	6	5	1.2 times

Cutting Performance

Comparison of cutting load



Cutter : EXN03R100U100-05 (in)
 Insert : LNMU0303ZER-MJ / ML
 Grade : AH725
 Work material : Carbon steels (1055 SAE)
 Cutting speed : $V_c = 820$ S.F.M
 Feed : $f_z = .020$ ipt
 Depth of cut : $a_p = .020$ "
 Width of cut : $a_e = 1.00$ "
 Coolant : Dry
 Machine : Vertical machining center BT40

Results: Less machine power consumption with DOFEEDMINI.

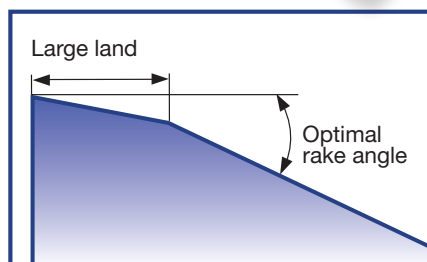
▶ Good for low rigidity machine!

- DoFeedMini is one of the best tools for roughing operations on carbon and pre-hardened steels. It is ideal for highly efficient milling of titanium, as used in the aerospace industry.



Chipbreaker

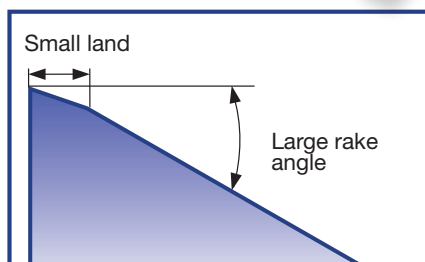
MJ Chipbreaker
(general purpose)



P Steel
K Cast iron
H Hard materials

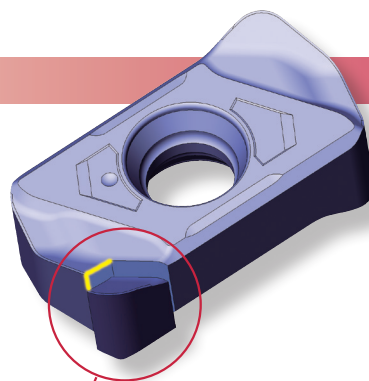
- Excellent combination of sharpness and strength
- Recommended for steel and cast iron machining

ML Chipbreaker
(lower cutting force)



M Stainless
S Super alloy

- Good sharpness
- Suitable for stainless steel and titanium
- Reduced chattering

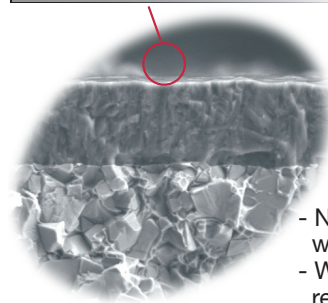


Grades

Special surface technology

PREMIUMTEC

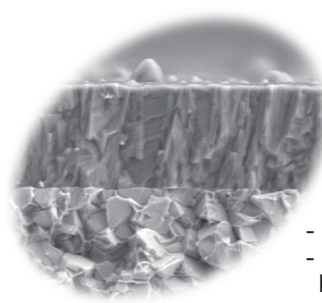
TUNGALOY



AH725

P Steel
K Cast iron
S Super alloy
H Hard materials

- Newly developed coating layer with a unique substrate
- Well balanced wear and chipping resistance
- Suitable for steels and cast irons

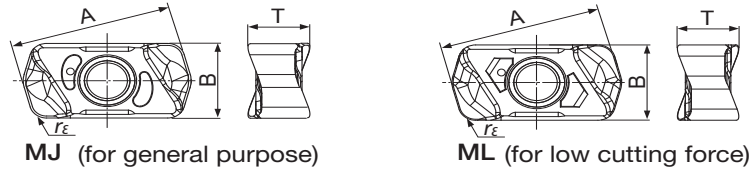


AH130

M Stainless
P Steel

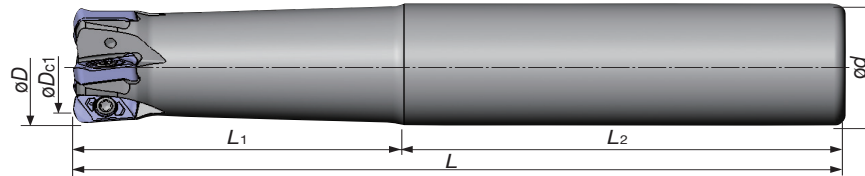
- Newly developed substrate
- Excellent balance between hardness and toughness
- Suitable for stainless steels

Insert Specification



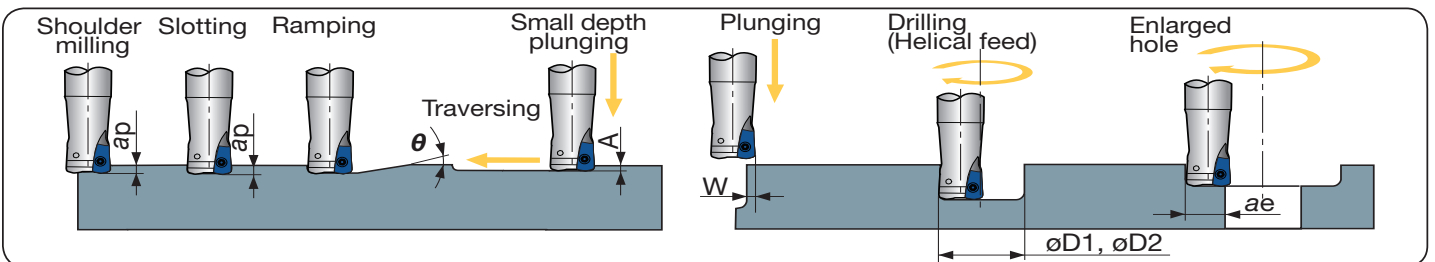
Cat. No.	Accuracy	Honing	Grades		Dimensions (in)			
			AH725	AH130	A	B	T	r_{ϵ}
LNMU0303ZER-MJ	M	With	●	●	.456	.236	.169	.047
LNMU0303ZER-ML	M	With	●	●				

Cutter Specification



Type	Cat. No.	Stock	No. of Inserts	Dimensions (in)						Weight (kg)	Air hole	Replacement Parts	
				ϕD	ϕd	ϕD_{c1}	L	L_1	L_2			Clamping Screw	Wrench
Standard	EXN03R062U0062-02	●	2	0.625	0.625	0.374	4.000	1.250	2.750	0.05	With	CSPB-2.5	IP-8D
	EXN03R068U0062-02	●	2	0.688	0.625	0.433	4.000	1.250	2.750	0.05			
	EXN03R075U0075-03	●	3	0.750	0.750	0.496	5.000	2.000	3.000	0.10			
	EXN03R087U0075-03	●	3	0.875	0.750	0.634	5.000	2.000	3.000	0.10			
	EXN03R100U0100-05	●	5	1.000	1.000	0.756	5.500	2.000	3.000	0.18			
	EXN03R112U0100-05	●	5	1.125	1.000	0.882	5.500	2.500	3.000	0.18			
EXN03R125U0125-06	●	6	1.250	1.250	1.008	6.000	3.000	3.000	0.31				
Long	EXN03R062U0062-02L	●	2	0.625	0.625	0.374	6.000	2.000	4.000	0.08			
	EXN03R068U0062-02L	●	2	0.688	0.625	0.433	6.000	1.000	5.000	0.08			
	EXN03R075U0075-03L	●	3	0.750	0.750	0.496	6.500	3.500	3.000	0.13			
	EXN03R087U0075-03L	●	3	0.875	0.750	0.634	6.500	1.250	5.250	0.13			
	EXN03R100U0100-05L	●	4	1.000	1.000	0.756	7.000	4.000	3.000	0.23			
	EXN03R112U0100-05L	●	4	1.125	1.000	0.882	7.000	1.500	5.500	0.23			
EXN03R125U0125-06L	●	5	1.250	1.250	1.008	8.000	5.000	3.000	0.41				

Applications



Cat. No.	Tool ϕ ϕD_c (in)	Effective edge length a_p (in)	Max. ramping angle θ	Max. plunging depth A (in)	Max. cutting width in plunging W (in)	Min. machinable hole ϕ $\phi D1$ (in)	Max. machinable hole ϕ $\phi D2$ (in)	Max. cutting width in enlarged hole a_e (in)
EXN03R062U0062-□□□	.625	.039	2.1°	.012	.138	.854	1.171	.487
EXN03R068U0062-□□□	.687	.039	1.7°	.012	.138	.980	1.296	.549
EXN03R075U0075-□□□	.750	.039	1.4°	.012	.138	1.106	1.421	.612
EXN03R087U0075-□□□	.875	.039	1.2°	.012	.138	1.354	1.671	.737
EXN03R100U0100-□□□	1.00	.039	1.0°	.012	.138	1.606	1.921	.862
EXN03R112U0100-□□□	1.125	.039	0.8°	.012	.138	1.854	2.171	.987
EXN03R125U0125-□□□	1.250	.039	0.7°	.012	.138	2.106	2.421	1.112

Standard cutting conditions

Work material	Hardness	Priority	Grades	Chip-breaker	Cutting Speed Vc (SFM)	Feed per tooth: fz (ipt)		
						Tool-ø: .625-.875	Tool-ø: 1.0-1.25	Plunging depth
Carbon steels (S45C, S55C etc.) (C45E, C55E etc.)	~ 300HB	First choice	AH725	MJ	330 - 980	.020 - .050	.020 - .060	.004
		for low cutting force	AH725	ML		.020 - .030	.020 - .040	
		for impact resistance	AH130	MJ		.020 - .050	.020 - .060	
Alloy steels (SCM440, SCr415 etc.) (42CrMo4, 17Cr3 etc.)	~ 300HB	First choice	AH725	MJ	330 - 660	.020 - .050	.020 - .060	.004
		for low cutting force	AH725	ML		.020 - .030	.020 - .040	
		for impact resistance	AH130	MJ		.020 - .050	.020 - .060	
Prehardened steels (NAK80, PX5 etc.)	30 ~ 40HRC	-	AH725	MJ	330 - 660	.020 - .050	.020 - .040	.004
Stainless steels (SUS304, SUS316 etc.) (X5CrNi18-10, X5CrNiMo17-12-2 etc.)	~ 200HB	First choice	AH130	ML	330 - 490	.012 - .020	.012 - .030	.003
		for impact resistance	AH130	MJ		.012 - .031	.012 - .031	
Grey cast irons (FC250, FC300 / GG25, GG30 etc.)	150 ~ 250HB	-	AH725	MJ	330 - 980	.020 - .050	.020 - .060	.004
Ductile cast irons (FCD400 / GGG40 etc.)								
Titanium alloy (Ti-6Al-4V etc.)	~ 40HRC	-	AH725	ML	100 - 200	.012 - .020	.012 - .030	.003
Hardened steels	(SKD67 etc.) (X40CrMoV5-1 etc.)	-	AH725	MJ	260 - 430	.004 - .008	.004 - .012	.002
	(SKD11 etc.)							

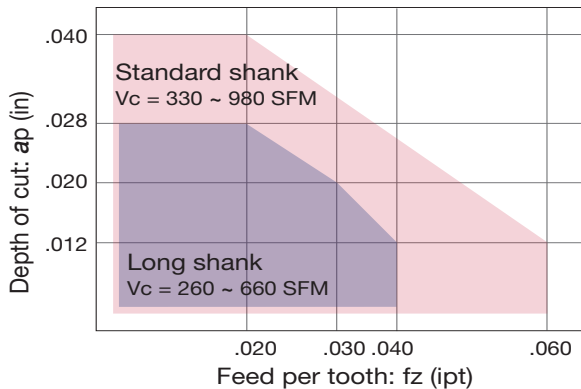
- When chips stay in the cutting zone during slotting or pocketing, use air to remove chips from the work area.
- Tool overhang length must be as short as possible to avoid chatter. When the tool overhang length is long, decrease the number of revolutions and feed.

■ 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 usage of a standard & long shank

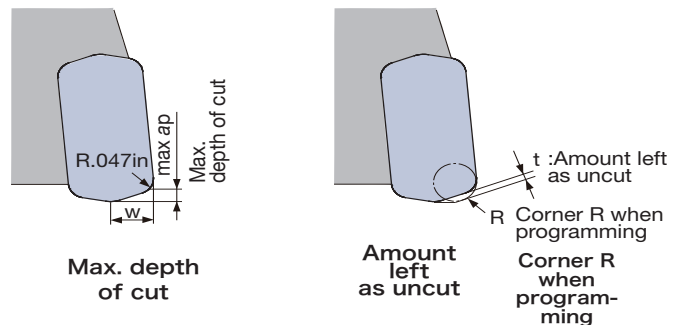
When using a long shank, please lower the cutting condition (Vc, fz, ap) to 70% of the standard shank.



Tool-ø: ø0.625 ~ 1.250
 Work material: Carbon steels
 1055 SAE (200HB)
 L/D ratio of overhang
 Standard shank: L/D ≤ 3
 Long shank: L/D = 4

■ Tool geometry on programming

When programming for CAD/CAM, the tool should be assumed to be a radius cutter as shown in the below table. In this case, the amount left as uncut (t) is shown in the below table.

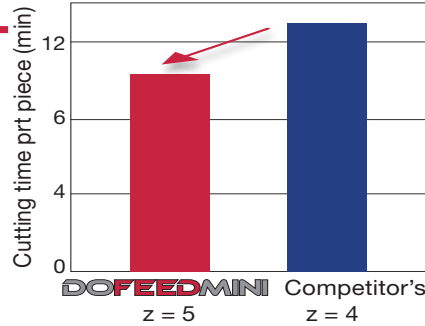


Max. depth of cut max ap (in)	W (in)	Amount left as uncut t(in)	Corner R when programming
.039"	.118"	.024"	R .040"
		.020"	R .060"

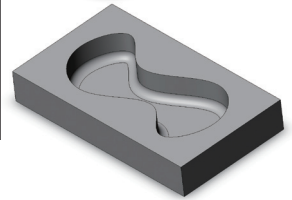
Practical examples

Pocket milling of die & mold

Cutter : EXN03R100U0100-05 ($\phi 1.00''$, $z = 5$)
 Insert : LNMU0303ZER-MJ
 Grade : AH725
 Work material : S55C (1055 SAE)
 Cutting speed : $V_c = 820$ SFM
 Feed : $f_z = .040$ ipt
 Depth of cut : $a_p = .020''$
 Width of cut : $a_e = .600 \sim .980$ in
 Coolant : Dry (air)
 Machine : Vertical machining center BT40



Saving time:
20%

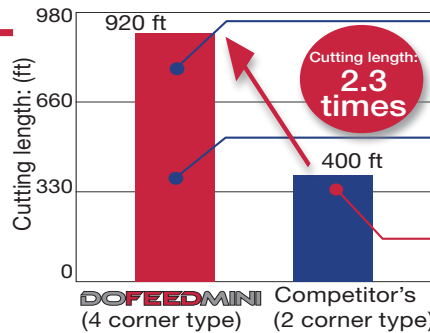


Results: High density of close pitch cutter delivers long tool life when combined with PremiumTec

20% reduction of machining time, Tool life is Doubled!

Machining of prehardened steels (40HRC)

Cutter : EXN03R100u0100-05 ($\phi 1.00$, $z = 5$)
 Insert : LNMU0303ZER-MJ
 Grade : AH725
 Work material : Prehardened steels (40HRC)
 Cutting speed : $V_c = 330$ SFM
 Feed : $f_z = .031$ ipt
 Depth of cut : $a_p = .020''$
 Width of cut : $a_e = .710''$
 Coolant : Dry (air)
 Machine : Vertical machining center BT40



$VB_{max} = .0120''$
Cutting time: 69 min.



$VB_{max} = .0122''$
Cutting time: 29 min.

Results: 2.3 time improvement of cutting time

Saving 75% of tool cost!

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