

MILLLINE Shoulder milling cutter**DOREC****New Version**
Featuring new
18 size insert**High performance economical double sided inserts
with 4 cutting edges!**

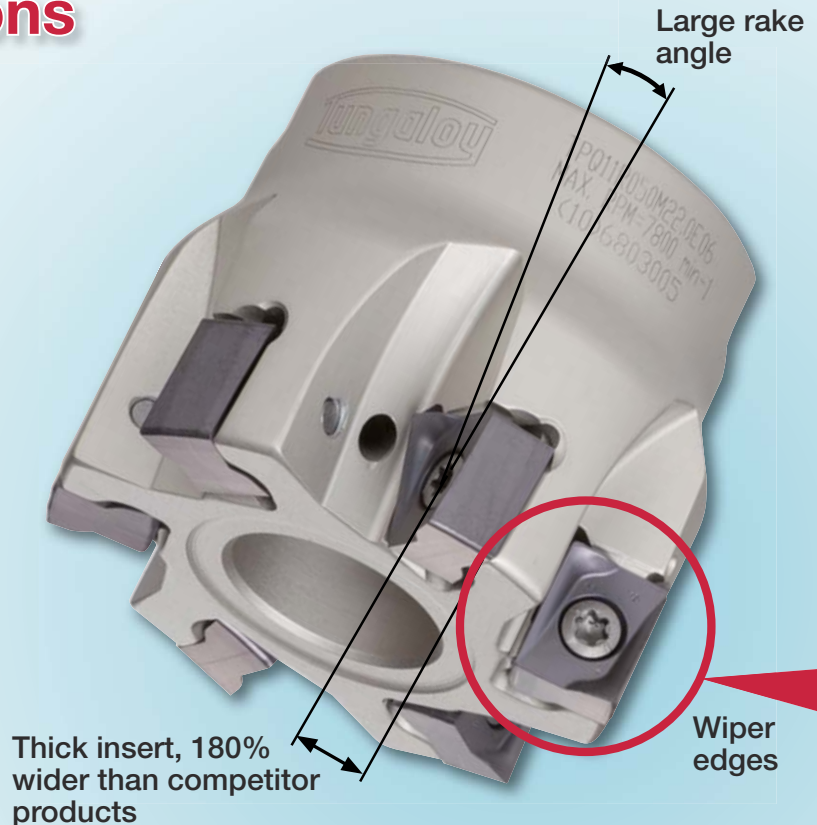
Economical insert with 4 edges to offer remarkable productivity levels!

High performance levels with a diverse range of applications

- Double sided square insert



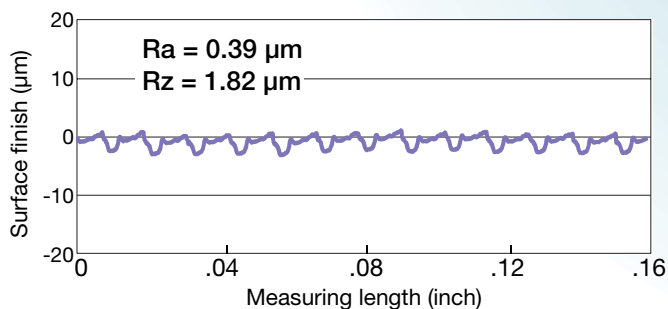
With 2 insert sizes, 3 grades and 4 corner radii options, DoRec suits most applications.



Low cutting force + Excellent surface finish

- Insert has high level of sharpness and incorporates effective wiper edges.

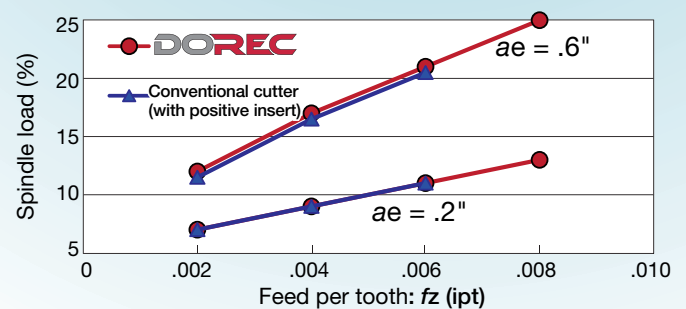
Surface finish



Cutter	: TPQ18R200U0075A03	Cutting speed : $V_c = 500 \text{ sfm}$
	($\phi D_c = 2"$, $z = 3$)	Feed per tooth: $f_z = .004 \text{ ipt}$
Insert	: LQMU1808008PNER-MJ	Depth of cut : $a_p = .4"$
Grade	: AH725	Width of cut : $a_e = 2"$
Work material	: 1055 (200HB)	Coolant : Dry
		Machine : Vertical M/C, BT50

Exceptional surface finish with economical insert!

Comparison of spindle load

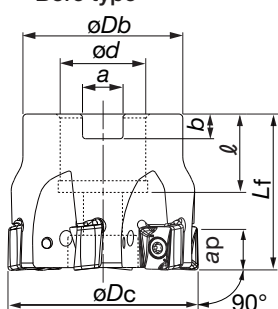


Cutter	: TPQ18R200U0075A03	Cutting speed : $V_c = 500 \text{ sfm}$
	($\phi D_c = 2"$, $z = 3$)	Depth of cut : $a_p = .630"$
Insert	: LQMU1808008PNER-MJ	Coolant : Dry
Work material	: 1055 (200HB)	Machine : Vertical M/C, BT50

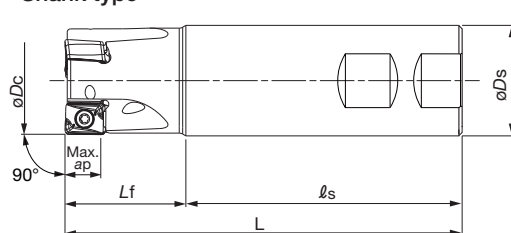
Similar load levels as a conventional tool!

Milling cutter

Bore type



Shank type



Replacement parts

Description		Cat. No.	
Applicable cutter		T/EPQ11..	T/EPQ18
Clamping screw		CSTB-3.5L115	SR14-591
Wrench	Torx bit	BLDT10/S7	BT20M
	Grip	SW6-SD	H-TB
Mono block type substitution wrench		T-10D	T-20D

LQMU11 type: Max. ap: .354"
LQMU18 type: Max. ap: .630"

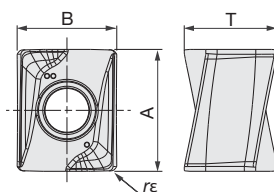
Bore type

Cat. No.	Stock	No. of Inserts	Dimensions (inch)							Weight (lb)	Air hole	Center bolt
			ϕDc	ϕDb	ϕd	ℓ	L_f	b	a			
TPQ11R200U0075A06	●	6	2.000	1.693	.750	.750	1.575	.197	.315	.77	with	C0.375x1.125H
TPQ11R250U0075A07	●	7	2.500	1.693	.750	.750	1.575	.197	.315	1.10	with	C0.375 x1.125H
TPQ11R300U0100A10	●	10	3.000	1.969	1.000	1.024	1.969	.236	.374	2.09	with	C0.500 x1.375H
TPQ11R400U0150A12	●	12	4.000	3.150	1.500	1.378	1.969	.394	.626	3.08	with	TMBA-0.750H
New TPQ18R200U0075A03	●	3	2.000	1.772	.750	.750	1.575	.197	.315	.80	with	*(C0.375x1.125H)
New TPQ18R250U0100A04	●	4	2.500	2.165	1.000	1.024	1.969	.236	.374	1.00	with	*(C0.375x1.125H)
New TPQ18R300U0100A05	●	5	3.000	2.165	1.000	1.024	1.969	.236	.374	2.00	with	*(C0.500x1.375H)
New TPQ18R400U0150A06	●	6	4.000	3.150	1.500	1.378	1.969	.394	.626	3.10	with	*(TMBA-0.750H)
New TPQ18R500U0150A08	●	8	5.000	3.150	1.500	1.496	2.480	.394	.626	6.30	with	*(TMBA-0.750H)
New TPQ18R600U0200A09	●	9	6.000	3.937	2.000	1.496	2.480	.433	.748	9.10	Without	-

Shank type

Cat. No.	Stock	No. of Inserts	Dimensions (inch)					Weight (kg)	Air hole	Shank type
			ϕDc	ϕDs	ℓ_s	L_f	L			
EPQ11R100U0100W02	●	2	1.000	1.000	2.280	1.220	3.500	.75	with	Weldon
EPQ11R125U0125W03	●	3	1.250	1.250	2.500	1.500	4.000	1.54	with	
EPQ11R150U0125W04	●	4	1.500	1.250	2.250	1.750	4.000	1.65	with	

Inserts



Cat. No.	Accuracy	Honing	Grades Coated			Dimensions (inch)				Cutter
			AH725	AH120	AH140	A	B	T	r_E	
LQMU110704PNER-MJ	M	with	●	●	●	.433	.354	.327	.016	EPQ11R TPQ11R
LQMU110708PNER-MJ	M	with	●	●	●	.433	.354	.327	.031	
LQMU110716PNER-MJ	M	with	●	●	●	.433	.354	.327	.063	
New LQMU180804PNER-MJ	M	with	●	●	●	.689	.453	.429	.016	TPQ18R EPQ18R
New LQMU180808PNER-MJ	M	with	●	●	●	.689	.453	.429	.031	
New LQMU180816PNER-MJ	M	with	●	●	●	.689	.453	.429	.063	
New LQMU180824PNER-MJ	M	with	●	●	●	.689	.453	.429	.094	

● : Stocked items

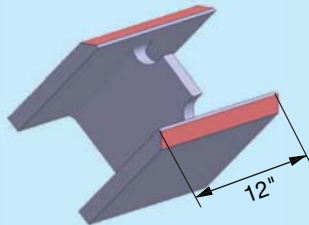
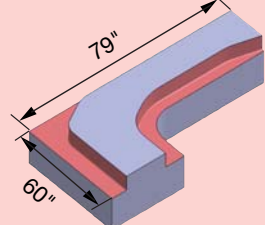
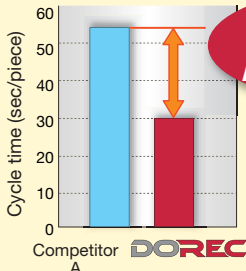
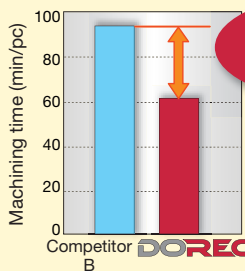
Standard cutting conditions

Workpiece materials	Hardness HB	Grades	Cutting speed Vc (sfm)	Feed per tooth fz (ipt)
Low carbon steel (1018, 8620 etc.)	~ 200	AH725	330 - 800	.004 - .010
High carbon steel (F-6180 etc.)	200 ~ 300		330 - 750	.004 - .008
Alloy steel (4140, 4340 etc.)	150 ~ 300			
Tool steel (A-6, D-1, D-2 etc.)	~ 300		330 - 600	
Stainless steel (300 Series, 304, 316 etc.)	-	AH140	300 - 600	.004 - .010
Grey cast iron (No 35 B, No 45 B etc.)	150 ~ 250	AH120	450 - 800	.004 - .010
Ductile cast iron (60-40-18 etc.)			360 - 640	.004 - .010
Superalloys (Inconel 718, Ti-6Al-4V etc.)	-	AH725	65 - 500	.003 - .008

- To remove excessive chip accumulation use an air blast.
- When cutting an interrupted surface or a casted skin, the feed per tooth (fz) should be reduced to the lower recommended value shown in the above table.

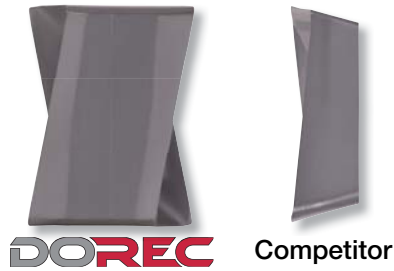
- Cutting conditions are limited by machine power, work piece rigidity and spindle output. When the cutting width, depth or overhang length is large, set Vc and fz to the lower recommended values and check the machine power and vibration.

Practical examples

Part of workpiece		Machine component	Press mold
Milling cutter		EPQ11R125U0125W03(ø1.25", z = 3)	TPQ18R300U0100A05 (ø3", z = 4)
Insert		LQMU110708PNER-MJ	LQMU180816PNER-MJ
Grade		AH725	AH120
Workpiece material		Low carbon steel (150HB)	No 35 B (180HB)
			
Cutting conditions	Cutting speed: Vc (sfm)	660	660
	Feed per tooth: fz (ipt)	.008	.008
	Depth of cut: ap (inch)	.315	.472
	Width of cut: ae (inch)	.157	.787 - 2.362
	Method of machining	Side milling	Shoulder milling
	Coolant	Dry	Dry
	Machine	Vertical M/C, BT40	Vertical M/C, BT50
Results		 180% productivity improvement Vf = 26 → 47 ipm High feed rate significantly reduces machining time. Stable tool life is provided with the reduction of sudden insert fracture.	 130% productivity improvement Vf = 19 → 32 ipm Due to the tough cutting edge, higher feed per tooth can be applied to reduce the machining time.



Extremely tough cutting edges lead to efficient machining.



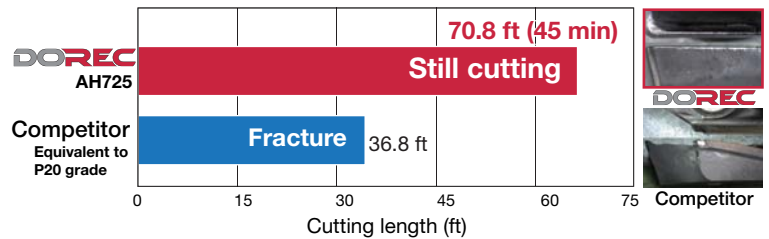
Incredible productivity!

**Insert thickness:
1.8 times wider than competitor!**

High fracture resistance



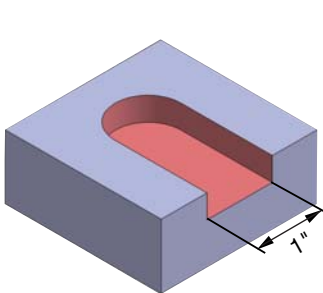
Comparison of fracture resistance



Tool diameter : $\phi D_c = \phi 1.000"$ Depth of cut : $a_p = .2"$
 Corner radius : $r_\epsilon = .016"$ Width of cut : $a_e = .5"$
 Work material : 1055 (200HB) Coolant : Dry
 Cutting speed : $V_c = 500$ sfm No. of inserts: Only used 1 insert
 Feed per tooth: $f_z = .010$ ipt Machine : Vertical M/C, BT50

High feed milling improves machining efficiency.

Comparison of metal removal rate



Application: Slot milling
 Work material: 1055 (200HB)
 Machine: Vertical M/C, BT50

Cutting conditions	DOREC	Competitor
Cutter	EPQ11R100U0100W02 ($\phi D_c = \phi 1.000"$, $z = 2$)	$\phi D_c = \phi 1.000"$, $z = 3$
Insert	LQMU110704PNER-MJ AH725	Insert: Positive type with 2 corner P30 grade
Cutting speed: V_c (sfm)	660	490
Feed per tooth: f_z (ipt)	.006	.004
Depth of cut: a_p (inch)	.32	.2
Metal removal rate: Q (in ³ /min)	9.15	4.27





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