

**Tungaloy**

Member IMC Group

Keeping the Customer First

Tungaloy Report No. 390-EE

**MILLLINE** Shoulder milling cutter

**NEW**

**DOREC**

ISO dimensions

Remarkable productivity with tough cutting edges!



## Features

### ● Insert with tough cutting edges



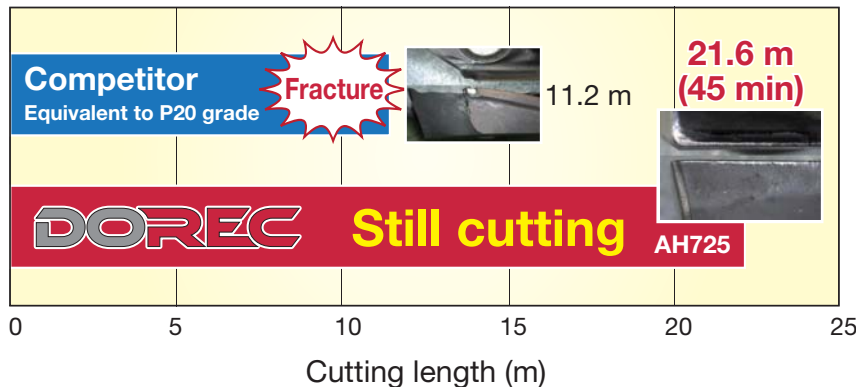
### ● Improved productivity in high feed machining



- Large rake angle reduces cutting forces
- Double sided insert with 4 corners
- Available in 3 types of corner radius: 0.4, 0.8 and 1.6 mm

## Cutting performance

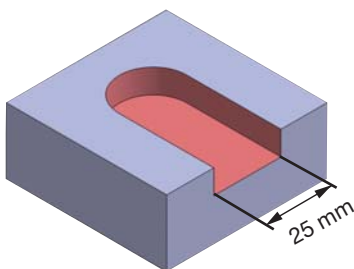
### ■ Comparison of chipping resistance



Tool diameter :  $\phi 25$  mm  
 Corner radius :  $r_{\epsilon} = 0.4$   
 Work material : C55 (200HB)  
 Machine : Vertical M/C, BT50  
 Cutting speed :  $V_c = 150$  m/min  
 Feed per tooth :  $f_z = 0.25$  mm/t  
 Depth of cut :  $a_p = 5.0$  mm  
 Width of cut :  $a_e = 12.5$  mm  
 Coolant : Dry  
 No. of inserts : Only used 1 insert

**Excellent stability even when high feed machining!**

### ■ Comparison of metal removal rate

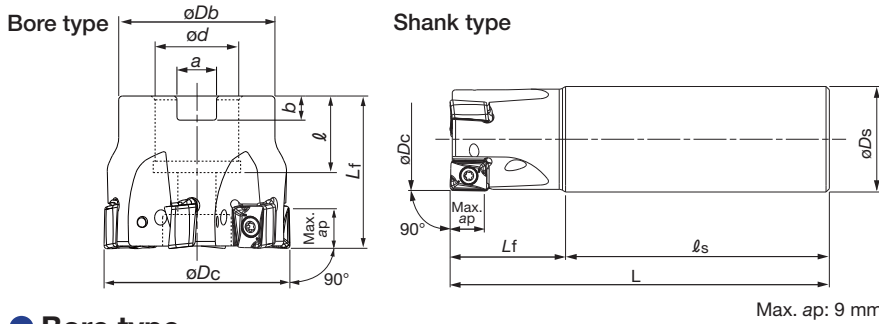


- Slotting
- Work material: C55 (200HB)
- Machine: Vertical M/C, BT50

Cutting conditions	DOREC	Competitor
Tool	EPQ11R025M25.0-02 ( $\phi 25$ mm, $z = 2$ )	$\phi 25$ mm, $z = 3$
Insert	LQMU110704PNER-MJ AH725	2 corner type insert, grade equivalent to P30
Cutting speed: $V_c$ (m/min)	200	150
Feed per tooth: $f_z$ (mm/t)	0.15	0.1
Depth of cut: $a_p$ (mm)	8	5
Metal removal rate: $Q$ (cc/min)	<b>150</b>	70



# Milling cutter



## Replacement parts

Descriptions		Cat. No.
Clamping screw		<b>CSTB-3.5L115</b>
Wrench	Torx bit	<b>BLDT10/S7</b>
	Grip	<b>SW6-SD</b>
Mono block type substitution wrench		<b>T-10D</b>

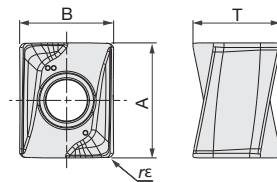
## Bore type

Cat. No.	Stock	No. of inserts	Dimensions (mm)							Weight (kg)	Air hole	Center bolt
			$\phi Dc$	$\phi Db$	$\phi d$	$\ell$	$L_f$	$b$	$a$			
TPQ11R040M16.0E05	●	5	40	35	16	19	40	5.6	8.4	0.2	with	CM8x30H
TPQ11R050M22.0E06	●	6	50	41	22	20	40	6.3	10.4	0.4	with	CM10x30H
TPQ11R063M22.0E07	●	7	63	41	22	20	40	6.3	10.4	0.5	with	CM10x30H
TPQ11R080M27.0E10	●	10	80	50	27	22	50	7	12.4	1.0	with	CM12x30H
TPQ11R100M32.0E12	●	12	100	60	32	28.5	50	8	14.4	1.4	with	TMBA-M16H

## Shank type

Cat. No.	Stock	No. of inserts	Dimensions (mm)					Weight (kg)	Air hole
			$\phi Dc$	$\phi Ds$	$\ell_s$	$L_f$	$L$		
EPQ11R025M25.0-02	●	2	25	25	80	35	115	0.3	with
EPQ11R032M32.0-03	●	3	32	32	80	35	115	0.7	with
EPQ11R040M32.0-04	●	4	40	32	80	35	115	0.8	with
EPQ11R050M32.0-05	●	5	50	32	80	40	120	0.9	with
EPQ11R063M32.0-06	●	6	63	32	80	40	120	1.1	with
EPQ11R080M32.0-07	●	7	80	32	80	40	120	1.4	with

# Inserts



Cat. No.	Accuracy	Honing	Grades			Dimensions (mm)				Cutter
			Coated			A	B	T	$r_\epsilon$	
			AH725	AH120	AH140					
LQMU110704PNER-MJ	M	with	●	●	●	11.0	9.0	8.3	0.4	EPQ11R TPQ11R
LQMU110708PNER-MJ	M	with	●	●	●	11.0	9.0	8.3	0.8	
LQMU110716PNER-MJ	M	with	●	●	●	11.0	9.0	8.3	1.6	

● : Stocked items

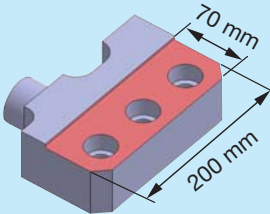
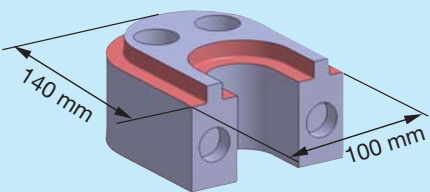
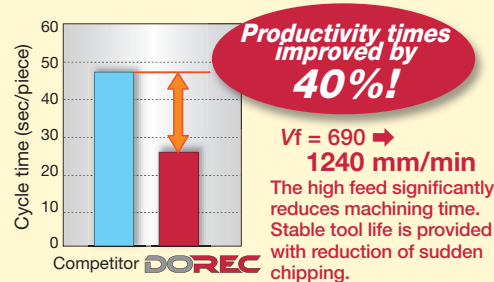
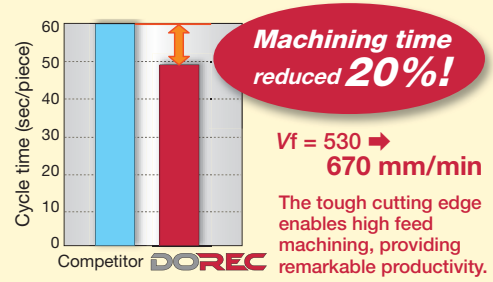
# Standard cutting conditions

Work materials	Hardness HB	Grades	Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)
Low carbon steel (C15E etc)	~ 200	<b>AH725</b>	180 (100-250)	0.18 (0.10-0.25)
High carbon steel (C45, C55 etc)	200 ~ 300		150 (100-230)	0.15 (0.10-0.20)
Alloy steel (42CrMo4, 17Cr3 etc)	150 ~ 300		120 (100-180)	
Tool steel (X155 CrVMo 12 1 etc)	~ 300			
Stainless steel (300 Series, X5 CrNi 18 9 etc)	-	<b>AH140</b>	150 (90-180)	0.18 (0.10-0.25)
Grey cast iron	150 ~ 250	<b>AH120</b>	180 (140-250)	0.18 (0.10-0.25)
Ductile cast iron				
Superalloys (Inconel 718, Ti-6Al-4V etc)	-	<b>AH725</b>	35 (20-50)	0.14 (0.08-0.20)

- To remove excessive chip accumulation use an air blast.
- When cutting an interrupted surface or a casting skin, the feed (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 parts (block)	Machine parts
Milling cutter		TPQ11R050M22.0E06 ( $\phi 50$ , $z = 6$ )	EPQ11R032M32.0-03 ( $\phi 32$ , $z = 3$ )
Insert		LQMU110708PNER-MJ	LQMU110708PNER-MJ
Grade		AH725	AH725
Work material		C55 (200HB)	42CrMo4 (32HRC)
			
Cutting conditions	Cutting speed: $V_c$ (m/min)	180	150
	Feed per tooth: $f_z$ (mm/t)	0.18	0.15
	Depth of cut: $a_p$ (mm)	5	Two 5 mm passes
	Width of cut: $a_e$ (mm)	Two 35 mm passes	10
	Method of machining	Shoulder milling	Shoulder milling
	Coolant	Dry	Dry
	Machine	Vertical M/C, BT50	Vertical M/C, BT40
Results			



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