

NEW Concept,
Economical Multi
Functional Tool

Innovative
Multi
Functional
Tool

Multi Turn

Fono: 055 787169 www.itachile.com

Features

- Improved surface roughness and reduced cutting load by inclined cutting edge.
- Stepping designed cutting edge enables stable machining by minimizing cutting edge part on workpiece when drilling starts.
- Excellent cutting performance by giving curves onto chips while drilling.
- Helix-angled flute design enables smooth chip evacuation and excellent drilling.
- Through coolant system leads longer tool life and smooth chip evacuation.



 **ITACHILE**
Commercial Machine LTDA

 **KORLOY Inc.**

Application



→ Internal, External, Face Turning, Drilling by only one tool

General Tooling

Multi Turn



Drilling



Drill



Internal machining



Internal holder



Face Turning & external machining



External holder



Multi Turn



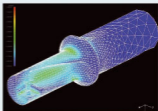
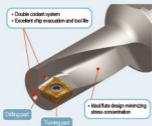
Multi Turn



Tool design by FEM analysis | Creative stepping cutting edge

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Tool design by FEM analysis



• Minimized stress during cutting, prevented damage from vibration and longer tool life.
 ➔ Optimized design

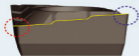
Creative stepping cutting edge

Drilling edge

(Drilling)

Turning edge

(Internal, external and face turning)



- Special chip-forming by edge geometry
- Better chip evacuation due to small radius width of chip cut

Comparison	Multi turn	A-maker	B-maker
Ir 0.08 (mm/h)			
Ir 0.10 (mm/h)			
Dig-width(mm)	80%	100%	120%

➔ Excellent chip evacuation and tool life guaranteed.



Multi Turn



Insert code system | Holder code system | Recommended tool by drill diameter

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Insert code system

Q	C	M	T	08	03	04	-	CM
Insert shape	Relief angle	Tolerance	Coax Section Type	Cutting Edge Length	Height of Cutting Edge	Face Radius		Chip Breaker



Designation	l	d	l ₁	r	Grades		
					P	M	K
					NC3120	PC9300	NC3010
QCMT 060204-CM	5.0	5.4	2.93	0.4	●	○	●
060204-CM	6.0	6.8	2.38	0.4	●	○	●
070304-CM	7.0	7.4	3.18	0.4	●	○	●
080304-CM	8.0	8.8	3.18	0.4	●	○	●
100304-CM	10.0	10.4	3.97	0.4	●	○	●

● Stock Item, ○ Under preparing for stock

Holder code system

M	T	2	0	R	2.	25	-	D
Brand/Name		Tool Diameter		Head of Tool		Apex ratio		



Designation	Stock		ØD	ØD ₁	ØD ₂	l ₁	l ₂	L	Inserts	Screws	Wrench
	R	L							Image of Insert	Image of Screw	Image of Wrench
MT 10RRL-2.25D	●	10	12	16	22.5	42.0	69.5	QC 060204	FTMA0204S	TW06P	
MT 12RRL-2.25D	●	12	16	20	27.0	45.0	76.0	QC 060204	FTNA0205S	TW06P	
MT 14RRL-2.25D	●	14	18	20	31.5	45.0	83.5	QC 070304	FTKA0255S	TW07P	
MT 16RRL-2.25D	●	16	20	25	36.0	60.0	94.0	QC 080304	FTNA0306	TW06P	
MT 20RRL-2.25D	●	20	25	32	45.0	60.0	111.0	QC 100304	FTNA0306	TW15P	

● Stock Item, ○ Under preparing for stock

Recommended tool by drill diameter

Tool diameter	Holder	Inserts
10mm	MT10RL-2.25D	QCMT060204-CM
12mm	MT12RL-2.25D	QCMT060204-CM
14mm	MT14RL-2.25D	QCMT070304-CM
16mm	MT16RL-2.25D	QCMT080304-CM
20mm	MT20RL-2.25D	QCMT100304-CM



Multi Turn



Comparison of Chip Controls(Drill) | Tool life comparison | Comparison on surface roughness

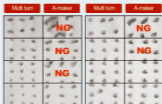
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Comparison of Chip Controls(Drill)

Cutting condition

- Holder: MT12R / MT16R-2.2SD
- Insert: GOMT060304/060304 - CM NC3120
- Workpiece: Low alloy steel(DIN 42CrMo4, SCM440)
- Cutting Speed(100m/min)
- Feed(0.04-0.12mm/rev)
- Drilling length(24-30mm), wet

- ➔ Superior chip chopping
- ➔ Stable chip breaker



Diameter(1.2mm)

Diameter(16mm)

Tool life comparison

Turning(Carbon steel: DIN C45, 5M4SC)

- Holder: MT14R-2.2SD
- Insert: GOMT070304-CM NC3120
- Application: External turning, Facing (Roughing, Finishing)

Cutting condition

- vc: 180m/min
- fn: 0.1-0.2mm/rev
- ap: 0.5-1.2mm, wet

Result



Turning (Low alloy steel)

- Holder: MT12R-2.2SD
- Insert: GOMT060304-CM NC3120
- Application: External turning, Facing (Roughing, Finishing)

Cutting condition

- vc: 180m/min
- fn: 0.1-0.2mm/rev
- ap: 0.5-1.2mm, wet

Result



Drilling=Turning(Low alloy steel)

- Holder: MT16R-2.2SD
- Insert: GOMT060304-CM NC3120
- Application (Cutter body): Drilling, External turning, Facing, Internal turning (Roughing, Finishing)

Cutting condition

- vc: 100-180m/min
- fn: 0.05-0.2mm/rev
- ap: 0.5-2.0mm, wet

Result



Comparison on surface roughness

Multi turn			<ul style="list-style-type: none"> • Visible roughness • Glossy surface → Superior
A-maker			<ul style="list-style-type: none"> • Visible roughness • Hazy surface → Inferior
			<ul style="list-style-type: none"> • Measurement • Ra: 0.47μm • Ry: 4.6μm
			<ul style="list-style-type: none"> • Measurement • Ra: 0.7μm • Ry: 5.6μm

Advantages of Multi Turn

Standard Tool



Using tool - Single
 Three kinds of tools
 External/Drill/Internal → Multi turn

Multi Turn



Preparatory time of work-Reduced
 20 min. → 5 min.

Operating time-Reduced
 10 min. / pcs → 8 min. / pcs



● Productivity comparison(Lot : 50 pcs)

Item	Standard tool
Preparatory time of work	20 min.
Operating time(30 pcs)	(30 × 10) 300 min.
Total production time	320 min.
Reduced production time (Productivity improved)	-

● Productivity comparison(Lot : 50 pcs)

Item	Multi Turn
Preparatory time of work	5 min.
Operating time(30 pcs)	(30 × 8) 240 min.
Total production time	245 min.
Reduced production time (Productivity improved)	22% (10%)

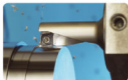


Finished goods

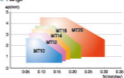
→ Superior productivity and cost reduction achieved.

User's guide

External / Internal turning



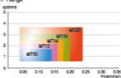
Range



Face turning



Range



Drilling

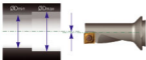


Drilling lead range by designation



Offset(Diameter revision)

Designation	Diameter	ØD _{min}	ØD _{max}
MT10FRL-2.25D	10	9.85	10.35
MT12FRL-2.25D	12	11.85	12.35
MT14FRL-2.25D	14	13.85	14.35
MT16FRL-2.25D	16	15.85	16.35
MT20FRL-2.25D	20	19.85	20.35



Drill diameter adjustable by offset revision.

Recommended cutting condition

Workpiece	Hardness(HRC)	NC1120		PC600		NC6110	
		Turning	Drilling	Turning	Drilling	Turning	Drilling
P	Low-carbon steel (<0.25%C)	80-180	150-200	100-150	-	-	-
	High-carbon steel (>0.25%C)	180-280	100-180	70-120	-	-	-
	Low alloy steel	140-200	100-180	70-120	-	-	-
	High alloy steel	200-350	80-150	60-100	-	-	-
M	Austenitic steels	135-275	-	-	140-210	100-150	-
	Martensitic steels	135-275	-	-	150-200	100-150	-
K	Gray cast irons	150-220	-	-	-	-	100-200
	Ductile cast irons	130-240	-	-	-	-	70-120

Clamping tip



Correct : High cutting edge position



Wrong : Low cutting edge position



Warning

Safety instruction

- Use glasses safety and face cover with protective equipment. If cutting condition and use method are inaccurate, you may be injured by broken tools or scattered chips.
- Excessive cutting load may influence badly on both tool and machine.
Make suitable tool replacement for preventing failure of machining.
- After machine stopped, clean remained chips from machine with special cleaning equipment.
- Keep safety distance from acute and hot chip during machining.
- Make precaution for prevention of fire in advance when you use insoluble cutting oil.
- Assembled parts may be scattered at high speed cutting. Please use protective equipment.