

Multi Turn



KORLOY Innovative multifunctional tool

Innovative combination for internal & external machining

- ▣ Reduced set-up times in complex machining cycles
- ▣ Double coolant supply for high durability

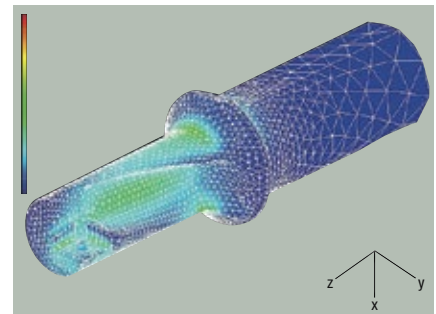
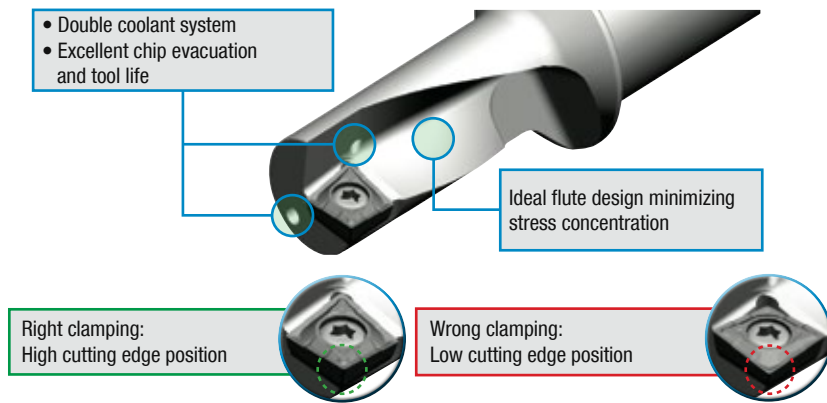


Multi Turn

Features

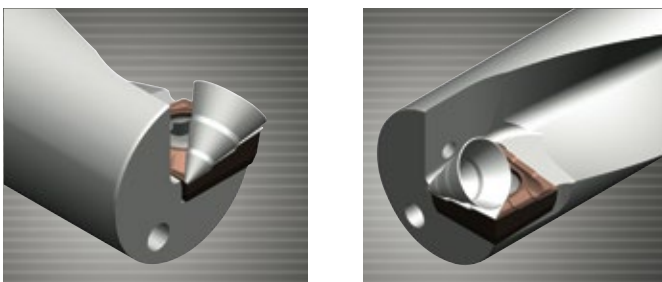
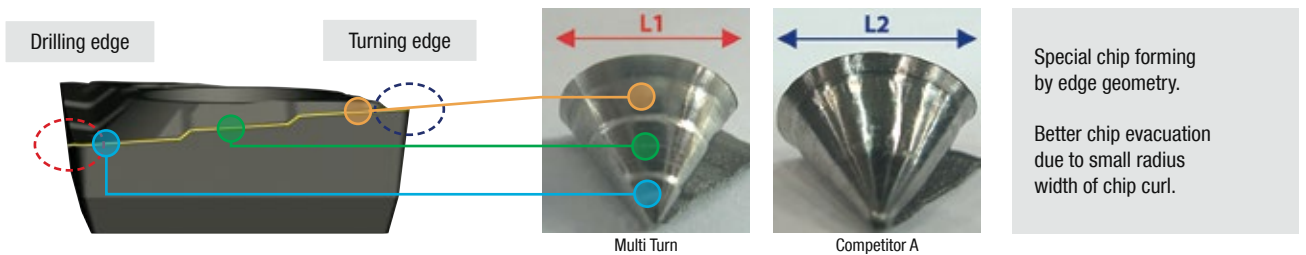
- Improved surface roughness and reduced cutting load by inclined cutting edge.
- Stepping designed cutting edge enables stable machining by minimizing cutting edge part on workpiece when drilling starts.
- Excellent cutting performance due to better chip curling while drilling.
- Helix-angled flute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

Tool design by FEM analysis



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

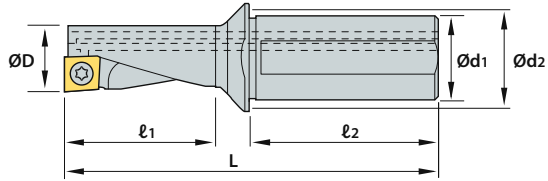
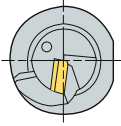
Innovative stepping cutting edge



Comparison	Multi Turn	Competitor A	Competitor B
fn 0.08 (mm/rev)			
fn 0.10 (mm/rev)			
Chip width	80%	100%	120%

Holder

MT (Multi Turn)



(mm)

Designation	ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
MT10R-1.5D	10	12	16	15,0	40,0	60,0	QC_T050204-__	FTNA0204S	TW06P
MT10R/L-2.25D	10	12	16	22,5	42,0	69,5	QC_T050204-__	FTNA0204S	TWP06P
MT12R/L1.5D	12	16	20	27,0	45,0	78,0	QC_T060204-__	FTNA02205S	TWP06P
MT12R/L2.25D	12	16	20	27,0	45,0	78,0	QC_T060204-__	FTNA02205S	TWP06P
MT14R-1.5D	14	16	20	31,5	45,0	83,5	QC_T070304-__	FTKA02555	TWP07P
MT14R/L-2.25D	14	16	20	31,5	45,0	83,5	QC_T070304-__	FTKA02555	TWP07P
MT16R-1.5D	16	20	25	36,0	50,0	94,0	QC_T080304-__	FTNA0306	TWP09P
MT16R/L-2.25D	16	20	25	36,0	50,0	94,0	QC_T080304-__	FTNA0306	TWP09P
MT20R-1.5D	20	25	32	45,0	56,0	111,0	QC_T10T304-__	FTNA03508	TWP15P
MT20R/L-2.25D	20	25	32	45,0	56,0	111,0	QC_T10T304-__	FTNA03508	TWP15P
MT25R/L-2.25D	25	32	40	56,5	61,0	130,0	QC_T130408-__	FTNC04509	TW20S
MT32R/L-2.25D	32	40	50	72,0	74,0	160,0	QC_T170508-__	FTNC04511	TW20S

Applicable inserts

Picture	Designation	Grades					Geometry
		P	M	K	N	S	
	QCMT-CM	PC5300 NC3120 NC3215 NC3220 NC3225	PC5300	PC5300 NC6210 NC6315		PC5300	
	QCMT(B)-CM				H01		
	QCGT-CA				H01		

(mm)

Multi Turn

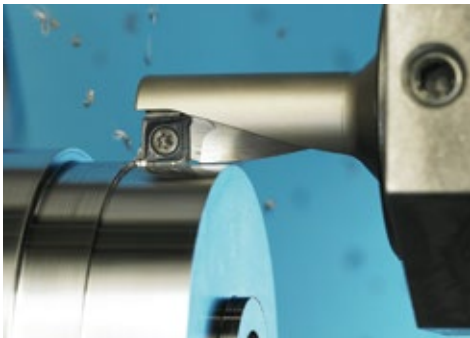
➔ Recommended cutting condition

Workpiece		Hardness (HB)	PC5300		NC3225		NC6315		H01	
			Turning	Drilling	Turning	Drilling	Turning	Drilling	Turning	Drilling
P	Low-carbon steel ($\leq 0.25\% C$)	80-180	100-180	100-150	150-300	100-150	-	-	-	-
	High-carbon steel ($> 0.25\% C$)	180-280	90-160	60-140	100-180	70-120	-	-	-	-
	Low alloy steel	140-260	70-120	50-120	100-180	70-120	-	-	-	-
	High alloy steel	200-350	60-110	50-100	80-150	60-100	-	-	-	-
M	Austenite	135-275	80-150	50-110	-	-	-	-	-	-
	Martensite	135-275	90-170	60-120	-	-	-	-	-	-
K	Gray cast iron	150-220	120-240	120-200	-	-	100-200	70-140	-	-
	Ductile cast iron	130-240	120-200	100-180	-	-	100-180	70-120	-	-
N	Aluminium alloy	30-150	-	-	-	-	-	-	200-500	140-220
	Copper alloy	150-160	-	-	-	-	-	-	150-300	140-200
S	HRSA	130-400	30-70	30-90	-	-	-	-	-	-

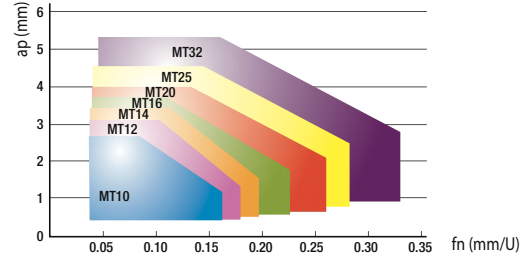


Applications

External / Internal turning



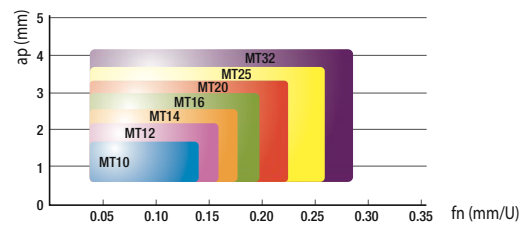
Application range



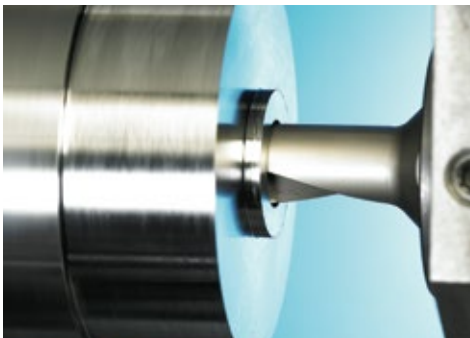
Facing



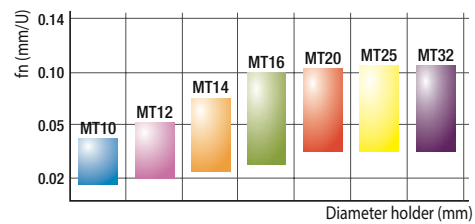
Application range



Drilling

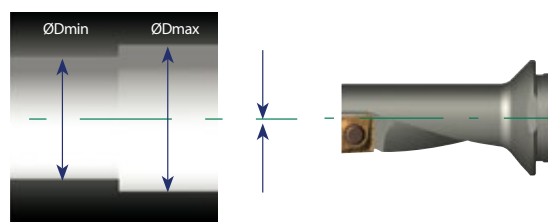


Drilling feed range



Offset (Diameter compensation)

Designation	Machined diameter (mm)	ØDmin (mm)	ØDmax (mm)
MT10R/L - __, __D	10	9,85	10,35
MT12R/L - __, __D	12	11,85	12,35
MT14R/L - __, __D	14	13,85	14,35
MT16R/L - __, __D	16	15,85	16,35
MT20R/L - __, __D	20	19,85	20,35
MT25R/L - __, __D	25	24,85	25,35
MT32R/L - __, __D	32	31,85	32,35



Drill diameter is adjustable by the offset compensation

Multi Turn

➔ Cutting performance

Comparison of chip controls (Drilling)


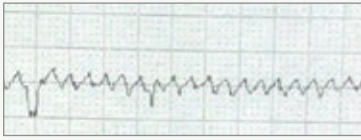


Multi Turn	Competitor A	Multi Turn	Competitor A
	 NG		 NG
	 NG		 NG
	 NG		
Diameter (12mm)		Diameter (16mm)	

- **Holder :**
MT12R / MT16R-2,25D
- **Insert :**
QCMT060204/080304-CM NC3220
- **Workpiece:**
Low alloy steel (SCM440)
- **Cutting conditions:**
vc: 100 m/min
fn: 0.04-0.12 mm/rev
wet

Tool life comparison

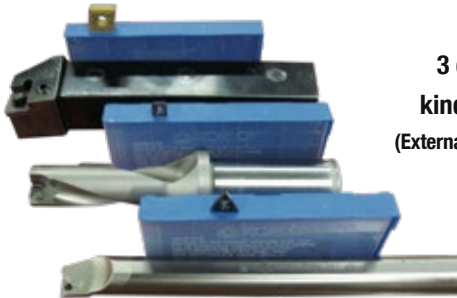
Turning Carbon steel (C45)	Turning Low alloy steel	Drilling und Turning Low alloy steel
<ul style="list-style-type: none"> ■ Holder : MT14R-2,25D ■ Insert : QCMT070304-CM NC3220 ■ Application: External turning and facing (Roughing & finishing) ■ Cutting conditions: vc: 180 m/min fn: 0.1-0,2 mm/rev ap: 0.5-1.2 mm wet 	<ul style="list-style-type: none"> ■ Holder : MT12R-2,25D ■ Insert : QCMT060204-CM NC3220 ■ Application: External turning and facing (Roughing & finishing) ■ Cutting conditions: vc: 180 m/min fn: 0.1-0.2 mm/rev ap: 0.5-1.2 mm wet 	<ul style="list-style-type: none"> ■ Holder : MT16R-2,25D ■ Insert : QCMT080304-CM NC3220 ■ Application: Drilling, facing, external and internal turning (Roughing & finishing) ■ Cutting conditions: vc: 100 - 180 m/min fn: 0.05-0.2 mm/rev ap: 0.5-2.0 mm / wet
<div style="display: flex; align-items: center; gap: 10px;"> <div style="background-color: #90EE90; padding: 5px; border: 1px solid black;">50 min</div> <div style="color: green; font-weight: bold;">Multi Turn</div> </div> <div style="display: flex; align-items: center; gap: 10px; margin-top: 5px;"> <div style="background-color: #D3D3D3; padding: 5px; border: 1px solid black;">25 min</div> <div>Competitor</div> </div>	<div style="display: flex; align-items: center; gap: 10px;"> <div style="background-color: #90EE90; padding: 5px; border: 1px solid black;">45 min</div> <div style="color: green; font-weight: bold;">Multi Turn</div> </div> <div style="display: flex; align-items: center; gap: 10px; margin-top: 5px;"> <div style="background-color: #D3D3D3; padding: 5px; border: 1px solid black;">22 min</div> <div>Competitor</div> </div>	<div style="display: flex; align-items: center; gap: 10px;"> <div style="background-color: #90EE90; padding: 5px; border: 1px solid black;">11 Pcs.</div> <div style="color: green; font-weight: bold;">Multi Turn</div> </div> <div style="display: flex; align-items: center; gap: 10px; margin-top: 5px;"> <div style="background-color: #D3D3D3; padding: 5px; border: 1px solid black;">6 Pcs.</div> <div>Competitor</div> </div>

Comparison on surface roughness

 Multi Turn		<ul style="list-style-type: none"> ■ Visible roughness Glossy surface → Superior ■ Measurement Ra: 0.47µm Rz: 4.56 µm
 Competitor		<ul style="list-style-type: none"> ■ Visible roughness Hazy surface → Interior ■ Measurement Ra: 0.70 µm Rz: 5.92 µm

Advantages of Multi Turn

Standard tools



Using tool - Single

3 different kinds of tools
(External, internal, drill)



Multi Turn

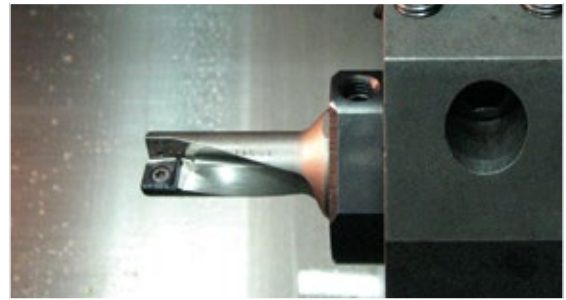
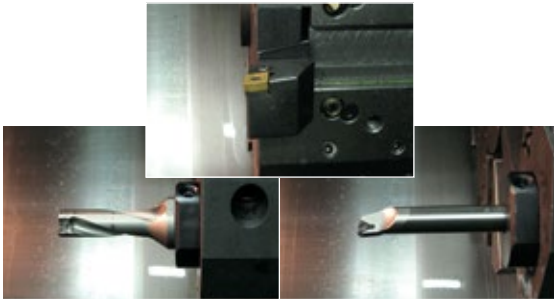


Preparatory time of work - Reduced

20 min. → 5 min.

Operatining time - Reduced

10 min. / Pcs. → 8 min. / Pcs.



Productivity comparison

Standard tools	
Preparatory time of work	20 min.
Operating time (50 Pcs.)	(50 * 10) 500 min.
Total production time	520 min.
Reduced production time (Productivity improved)	-

Productivity comparison

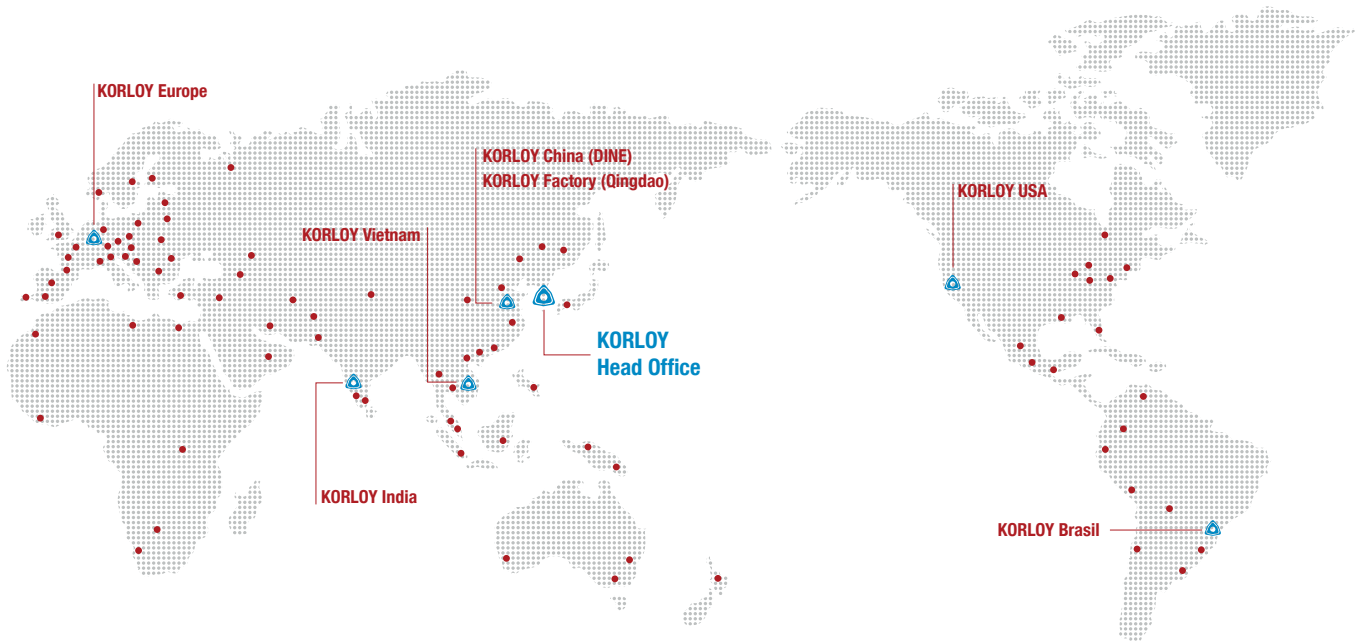
Multi Turn	
Preparatory time of work	5 min.
Operating time (50 Pcs.)	(50 * 8) 400 min.
Total production time	405 min.
Reduced production time (Productivity improved)	22% less Time (22% improved)



Finished goods



➔ Superior productivity and cost reduction achieved




Head Office

Holystar B/D, 1350, Nambusunhwan-ro, Geumcheon-gu, Seoul, 08536, Korea Web: www.korloy.com

Cheongju Factory

55, Sandan-ro, Heungdeok-gu, Cheongju-si, Chungcheongbuk-do, 28589, Korea

Jincheon Factory

54, Gwanghyewonsandan 2-gil, Gwanghyewon-myeon, Jincheon-gun, Chungcheongbuk-do, 27807, Korea

R & D Institute Cheongju

55, Sandan-ro, Heungdeok-gu, Cheongju-si, Chungcheongbuk-do, 28589, Korea

R & D Institute Seoul

Holystar B/D, 1350, Nambusunhwan-ro, Geumcheon-gu, Seoul, 08536, Korea



KORLOY EUROPE

Gablonzer Straße 25-27, D-61440 Oberursel, Germany, Tel: +49-6171-27783-0, Fax: +49-6171-27783-59
E-Mail: info@korloyeurope.com, Web: www.korloyeurope.com



KORLOY AMERICA

620 Maple Avenue, Torrance, CA 90503, USA



KORLOY INDIA

Ground Floor, Property No. 217, Udyog Vihar Phase 4, Gurgaon 122016, Haryana, India



KORLOY BRASIL

Av. Aruana 280, conj.12, WLC, Alphaville, Barueri, CEP06460-010, SP, Brasil



KORLOY VIETNAM

No. 133 Le Loi street, Hoa Phu ward, Thu Dau Mot city, Binh Duong proviende, Vietnam



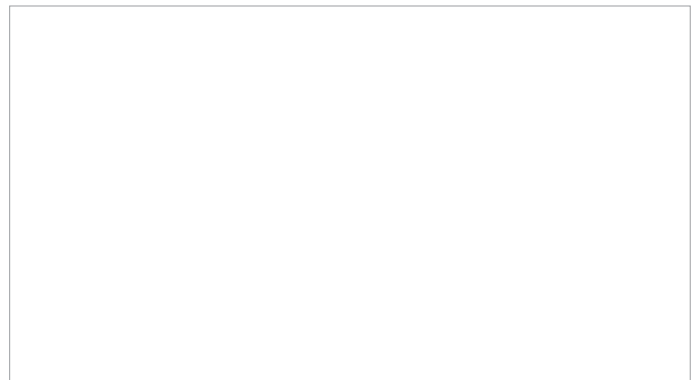
KORLOY FACTORY QINGDAO

Ground Dongjing Road 56 District Free Trade Zone. Qingdao, China



KORLOY FACTORY INDIA

Plot No. 415, Sector 8, IMT Manesar, Gurgaon 122051, Haryana, India



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