

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

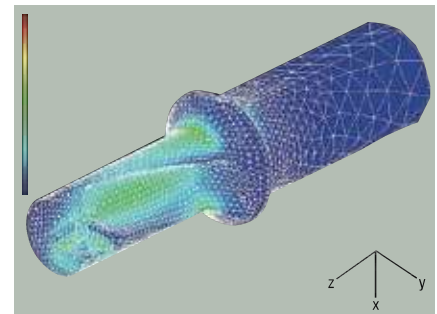
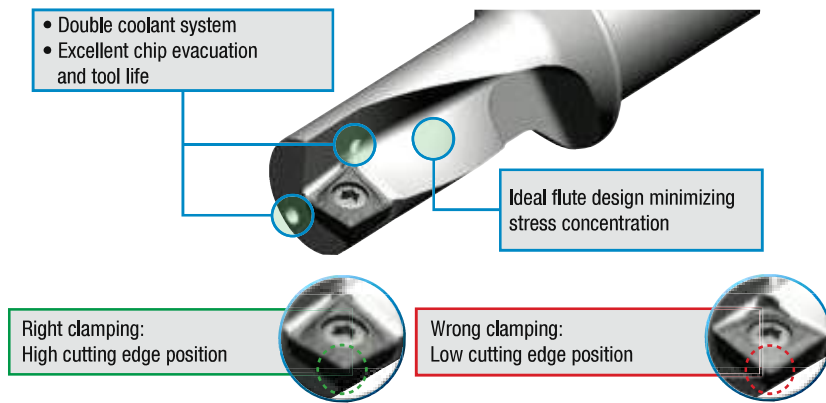


Multi Turn

Features

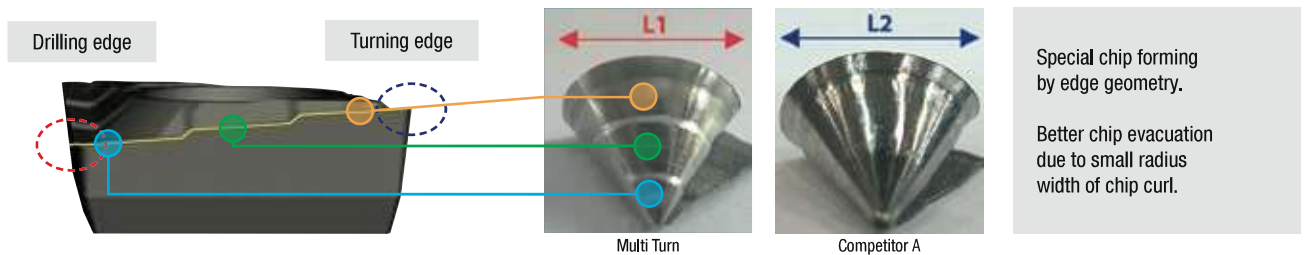
- Improved surface roughness and reduced cutting load by inclined cutting edge.
- Stepping designed cutting edge enables stable machining by minimizing cutting edge part on workpiece when drilling starts.
- Excellent cutting performance due to better chip curling while drilling.
- Helix-angled flute 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**

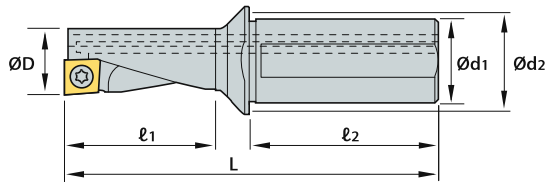
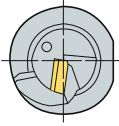
Innovative stepping cutting edge



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

Holder


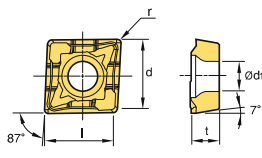

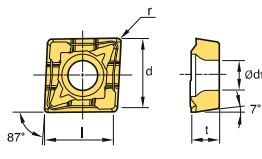

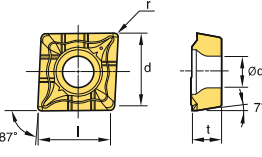
MT (Multi Turn)



(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

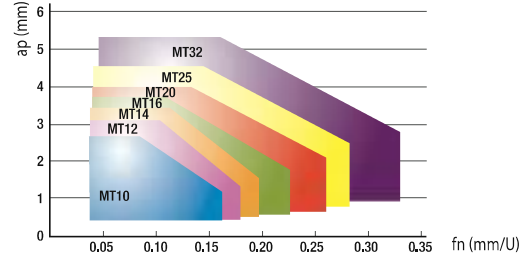
| Workpiece | | Hardness (HB) | PC5300 | | NC3225 | | NC6315 | | H01 | |
|-----------|--------------------------------------|---------------|---------|----------|---------|----------|---------|----------|---------|----------|
| | | | Turning | Drilling | Turning | Drilling | Turning | Drilling | Turning | 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 | - | - | - | - | - | - |



External / Internal turning



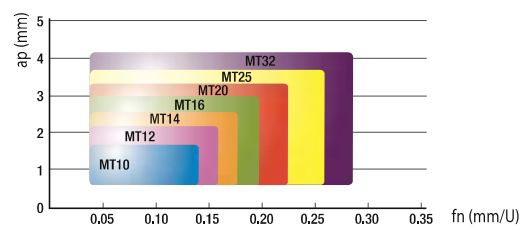
Application range



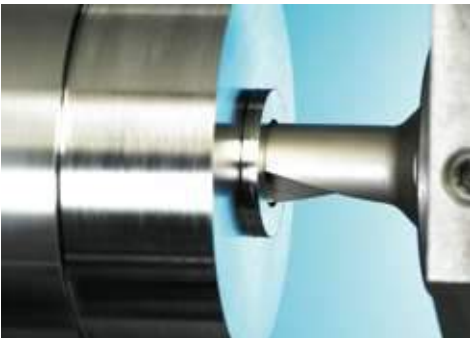
Facing



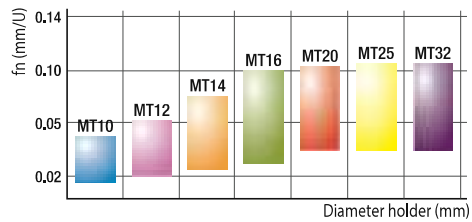
Application range



Drilling

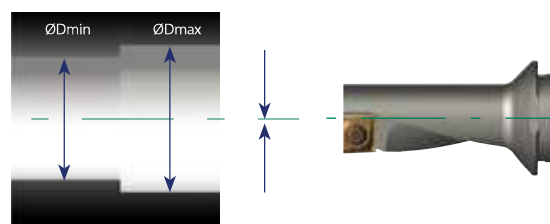


Drilling feed range



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 | | |
| | | | |


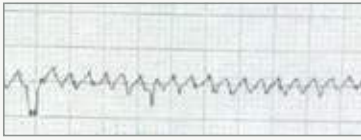

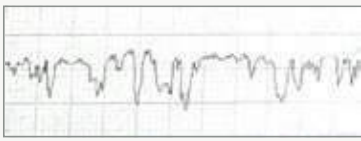
Diameter (12mm) Diameter (16mm)

- **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



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



Using tool - Single

Multi Turn

Multi Turn

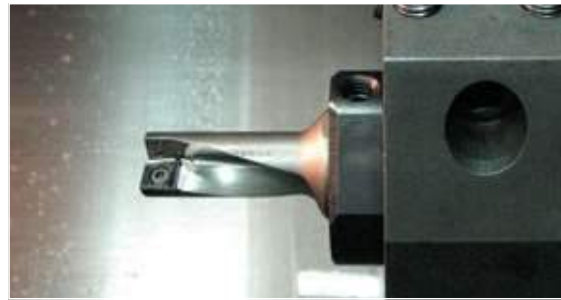


Preparatory time of work - Reduced

20 min. → 5 min.

Operating 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

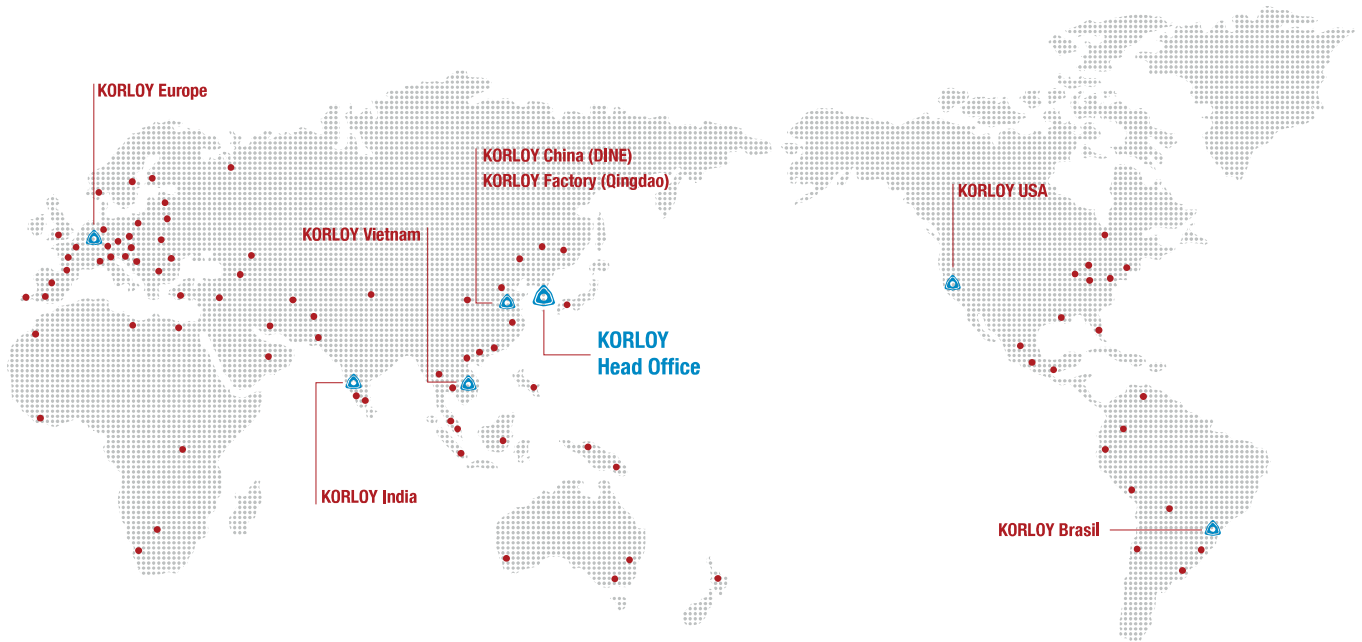
| Multi Turn | |
|---|------------------------------|
| Preparatory time of work | 5 min. |
| Operating time (50 Pcs.) | (50 * 8) 400 min. |
| Total production time | 405 min. |
| Reduced production time (Productivity improved) | 22% less Time (22% improved) |



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



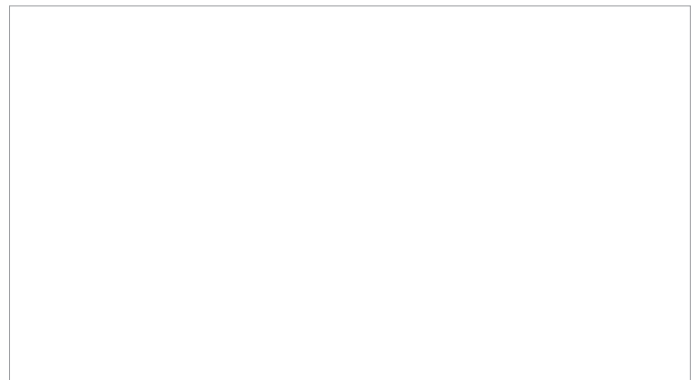
KORLOY FACTORY QINGDAO

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



KORLOY FACTORY INDIA

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



KTS - Korloy Tooling Solution



Get our **FREE App**

Just download, install and use.

