KORLOY TECH-NEWS

We Create Your Tomorrow!

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No: 189

since 1966~2006
40th Anniversary of KORLOY

Master-piece of Deep Hole Drilling

Mach Long Drill

New

Features

1. Specially designed cutting edge guarantees long tool life by generate low cutting force.
2. Special chip pocket design for effective chip evacuation.
3. Optimized design for drill rigidity to get rid of bending of drill during machining.
4. Lubrication & thermal resistance of coating has been increased by adopting new TiAlN.
5. Good chip evacuation due to special post treatment technique.
6. Over 20D deep hole drilling is possible without step drilling.
7. Best cutting performance with MQL system.
8. Guarantee tool life & cutting performance by efficient process management

KORLOY Inc.

Master-piece of Deep Hole Drilling

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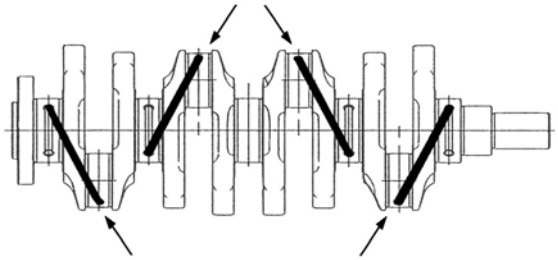
1. Deep hole drilling



Application example
(Oil hole for Crank Shaft, 20D)

New MLD

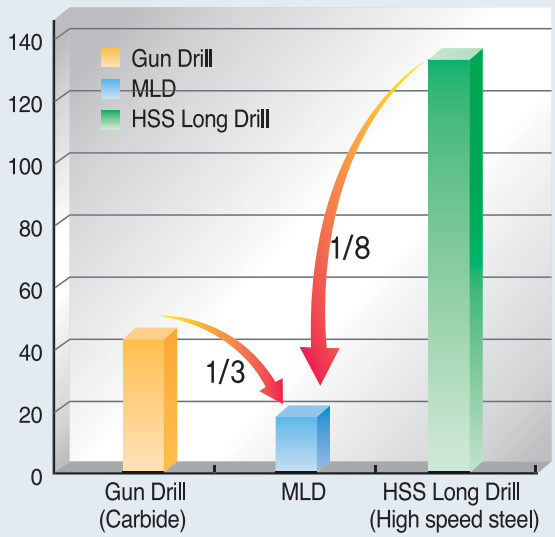
■ Mach Long Drill is ideal for...

- Deep and inclined hole drilling of crank shaft
- Coolant pass drilling of cam shaft
- Deep hole making of mold and machinery
  ➞deep hole drilling aspect ratio over 15D
- Saving cycle time for better productivity
- Tool guide bush is not required
- Reduce idle time by prolonged tool life
- Green coolant solution(MQL) to protect environment

• Ineffective conventional drilling : High Speed Steel Long Drill, Gun Drill...

■ MLD's Productivity : MLD0680-20A (Ø6.8 x 140 x 170L x 7S)

	V (m/min)	f (mm/rev)	N (rpm)	F (mm/min)	Coolant	Step operation
Mach Long Drill	80	0.14	3,747	525	MQL- Air out 0.4MPa, Oil 20cc/h	Not required
Gun drill (Carbide)	100	0.04	4,683	187	Inner coolant oil	-
High Speed Steel long drill	15	0.1	703	70	Outer coolant oil	15mm 9 times



■ Advantages of MLD against conventional drill

- Saving cycle time up to 8times
- Increasing productivity by process reduction
- Optimal efficiency with MQL system

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2. Features of MLD

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■ Cutting condition

Standard cutting condition for MLD 0600 - 20(28) A

	Carbon steel (Ck45, AISI1045)		Low alloy steel (41CrMo4,AISI4140)		Cast iron (GG/GGG)	
	V	f	V	f	V	f
MQL	90m/min	0.2mm/rev	80m/min	0.19mm/rev	70m/min	0.15mm/rev

• Mach Long Drill code system

MLD	**0590**	**-**	**20**	**A**
Mach Long Drill	Drilling diameter (ØD) 5.90mm		Aspect ratio : 20D 20 ×5.90 ≒ 120mm	Functional code (Order-made)

3. Notice for MLD drilling

1. Centering tolerance of Mach long drill from previously machined center of pilot drill should be within 0.01mm.
   - The tolerance affects sudden facture of long drill.
2. Composition for MQL system.
   - MQL system : Air over 6bar(0.6Mpa), Oil over 20cc/hour
   - Internal Oil supply system : Pumping pressure over 15bar(1.5Mpa), Coolant : Water soluble.
3. Machining sequence for tilted face : Endmilling to make flat face → Pilot drill → Mach long drill
   - In case of tilted face, sphere shape, convex or concave face should have endmill process first

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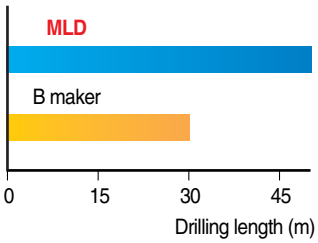
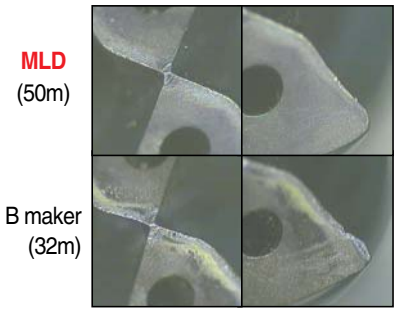
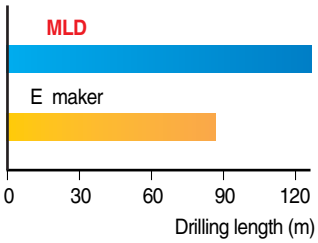
4. MLD application examples

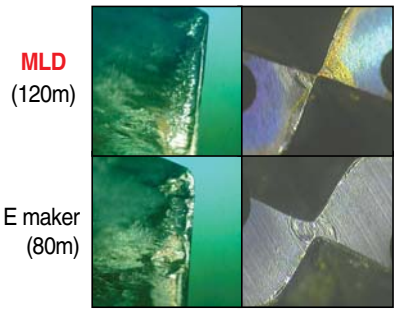
- Designation : MLD0590-20A
  (Ø5.9mm, Aspect ratio=20D)
- Workpiece : SCM440 (HRC20)
- Cutting condition
  V = 80m/min / 260sfm
  f = 0.14mm/rev / 0.0055ipr
  d = 75mm / 2.95inch
- Coolant : Air out 0.4Mpa / Oil 15cc/h

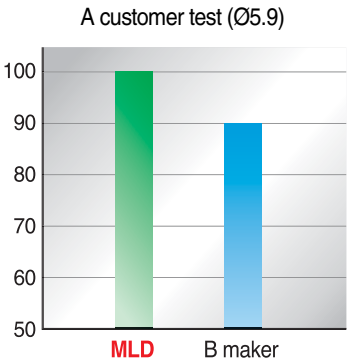


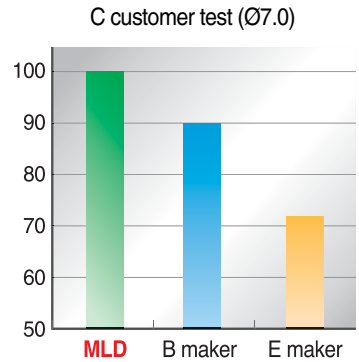


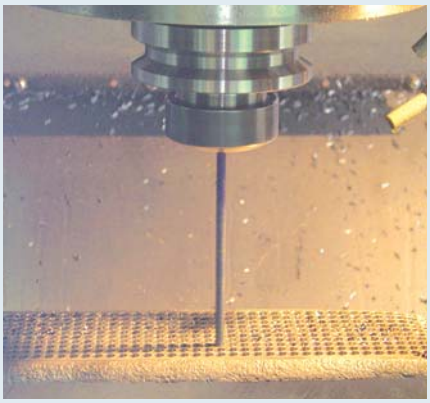
- Designation : MLD0700-22A
  (Ø7.0mm, Aspect ratio=22D)
- Workpiece : SCM440 (HRC22)
- Cutting condition
  V = 80m/min / 260sfm
  f = 0.19mm/rev / 0.0075ipr
  d = 80mm / 3.15inch
- Coolant : Air out 0.3Mpa / Oil 20cc/h







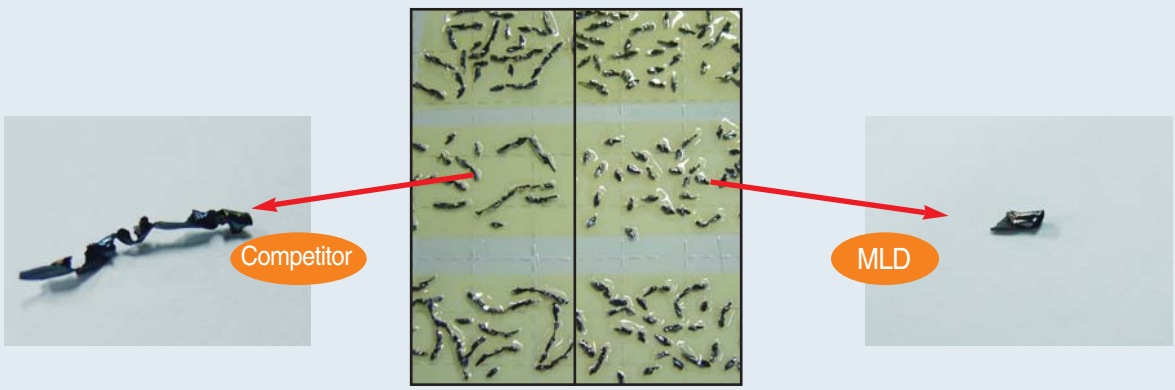




Mach Long Drill Test

■ Comparison of machined chip

Better chip breaking than competitors : reduction of chip evacuation resistance



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5. MLDP : Pilot drill

■ Features of MLDP

	diameter (ØD)	Length (L)	Point angle	Coolant hole
Mach Long Drill	D (tolerance h7)	Over 15D	140°	O
MLDP	D (tolerance x6)	Over 1.5~2D	155°	O

• MLDP code system

MLDP 0590 * 50-120L * 6S

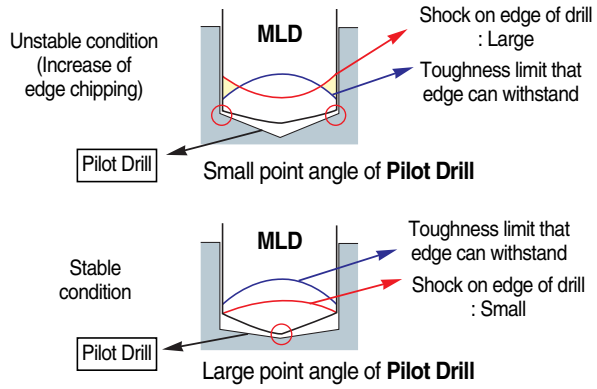
Pilot Drill	Drilling diameter Ø5.90mm	Length of flute (ℓ1) : 50mm Total length(L) : 120mm	Shank diameter Ø 6.0mm

MLDP Drilling diameter tolerance		×6
Excess	Under	
-	3	+0.020~0.026
3	6	+0.028~0.036
6	10	+0.034~0.043

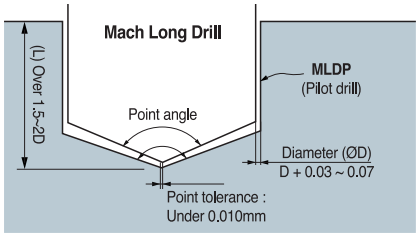
■ Notice for MLDP drilling

1. Hole size : When the diameter of MLDP is larger than MLD over 0.5mm, chattering of MLD would be happened due to incorrect base hole. Please apply to right tooling with proper KORLOY's MLDP
2. Hole making : In case the depth of MLDP is under 2D, noise and inaccuracy operation by chattering would be happen. We would like to recommend drilling over 2D hole
3. Point angle : The point angle of pilot drill should be bigger than MLD's due to effect on breakage and tool life of drill
4. Please notify the center point tolerance to be under 0.010mm

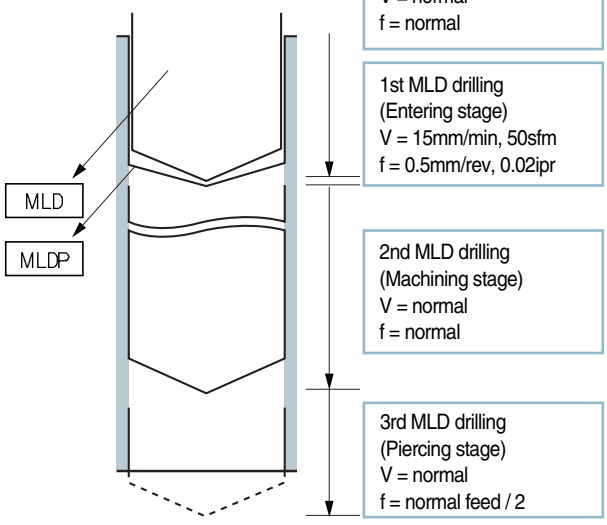
• Function of MLD & MLDP



Relationship of point angle between MLD & MLDP



Structure by point angle of **MLDP**



To make the most of the **MLD**

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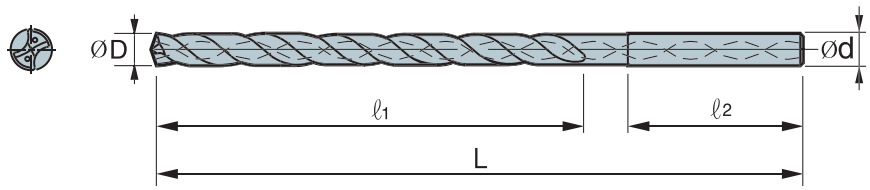
6. Order sheet

• Please fill out this form and send this to KORLOY sales dealers.

Drilling diameter (ØD) Available diameter : Ø2.5 ~ Ø15mm	mm	Special comment
Shank diameter (Ød) Available diameter : Ø3.0 ~ Ø15mm	mm	
Length of flute (ℓ_1) Max ℓ_1 : 250mm	mm	
Length of shank (ℓ_2)	mm	
Total length (L) Max L size : 310mm	mm	
Workpiece : Hardness : Product name :	V: N: f : F: Coolant :	



▶ Advice for making better choice of

1. Please make sure to choose short drill to improves tool life and consider drill length against diameter when you order.

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