SUMITOMO
CARBIDE - CBN - DIAMOND

Coated Carbide Drills

MULTIDRILL

NeXEO MDE Series

Rev. 1

Innovative General-Purpose Drills

- Next for Everyone -

Suitable for a wide range of Materials, from
high-carbon steels and die steels to stainless steels.
Stable Drilling for small machining center and lathes.

P M K N S H

SUMITOMO ELECTRIC GROUP

General-purpose drill suitable for a wide range of work materials and cutting conditions

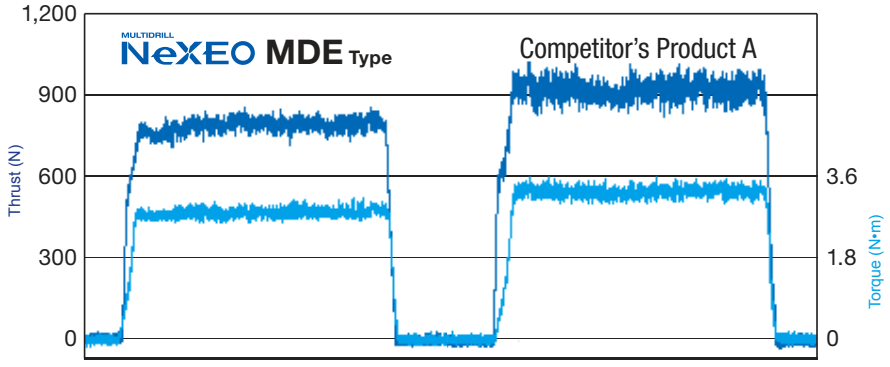
RX Thinning + Arc Shaped Cutting Lip

External Coolant Supply Internal Coolant Supply

Low resistance chip breaking

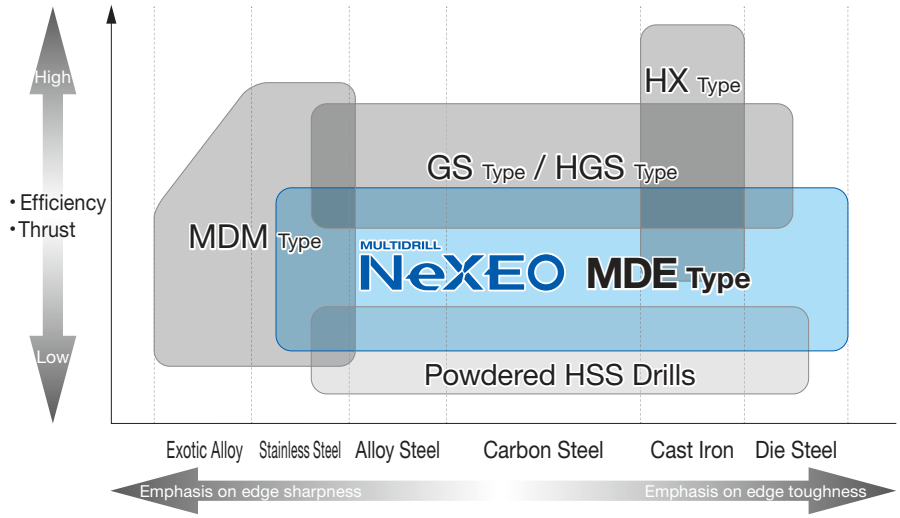
RX thinning reduces thrust

Also ideal for small machining centres and small lathes.



Work Material: C50, Diameter: Ø 8 mm, Hole Depth: 5D
Cutting Data: v_c = 80 m/min, f = 0,15 mm/rev, H = 38 mm (through), internal coolant supply (water soluble)

VIDEO OF CUTTNG



■ Good Chip Control with the New Arc-Shaped Edge

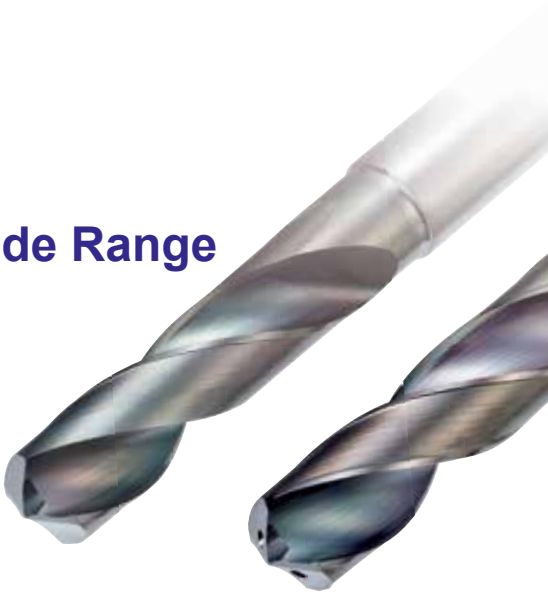
MULTIDRILL NeXEO MDE Type

Chips are cut into fine pieces

Competitor's Product B

Long chips

Work Material: C50, Diameter: Ø 9 mm, Hole Depth: 5D
Cutting Data: v_c = 80 m/min, f = 0,15 mm/rev, internal coolant supply (water soluble)



■ Stable and Long Tool Life Across a Wide Range of Drilling Applications

Resistant to Edge Chipping

General-purpose grade

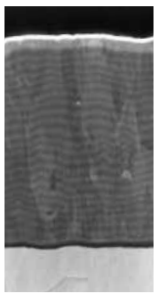
ACT100

Fine-grained Carbide Substrate

Featuring both wear and fracture resistance!

NX Coating

Absotech™ technology for high quality, high hardness, high strength and excellent wear resistance and thermal resistance.

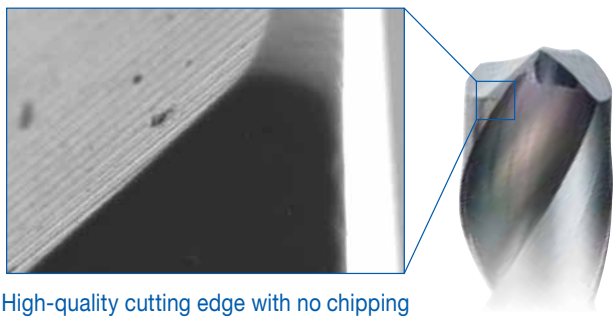


TiAlCrSi-based Super Multi-Layered Coated Carbide
Hardness HV: 46 GPa
Starting Temperature For Oxidisation: 1,100°C

Highly Adhesive Layer

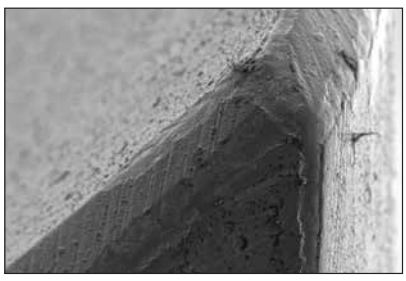
High-quality edge provides stable tool life

MULTIDRILL NeXEO MDE Type



High-quality cutting edge with no chipping

Competitor's Product A



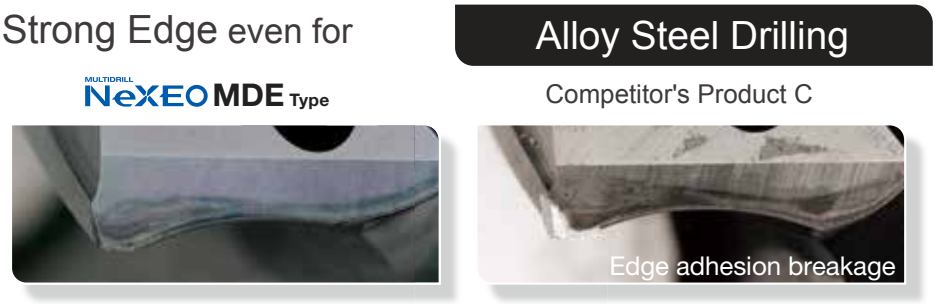
Chipping in edge coating

Stable and Long Tool Life Across a Wide Range of Drilling Applications

Strong Edge even for **High Carbon Steel Drilling**

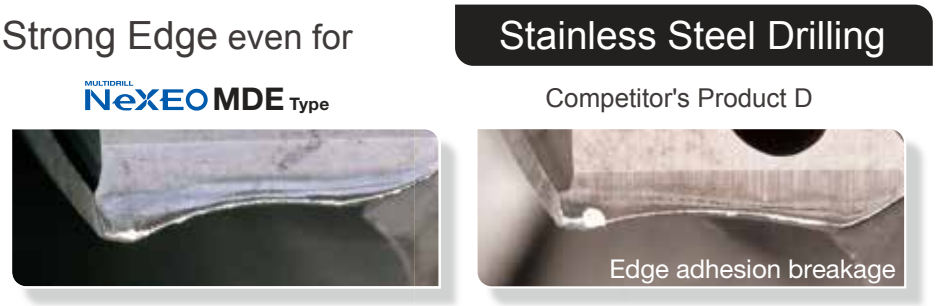
Work Material: C50, Cutting Data: v_c = 80 m/min, f = 0,15 mm/rev, internal coolant supply (water soluble)

Strong Edge even for **Alloy Steel Drilling**



Work Material: 15CrMo5, Cutting Data: v_c = 110 m/min, f = 0,2 mm/rev, internal coolant supply (water soluble)

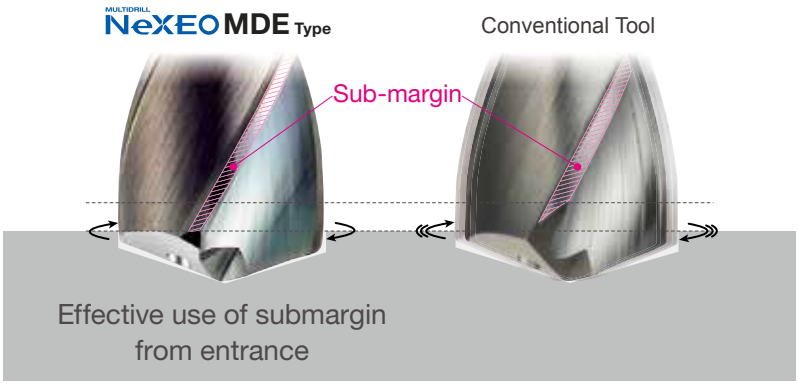
Strong Edge even for **Stainless Steel Drilling**



Work Material: X5CrNiS18 10, Cutting Data: v_c = 60 m/min, f = 0,1 mm/rev, internal coolant supply (water soluble)

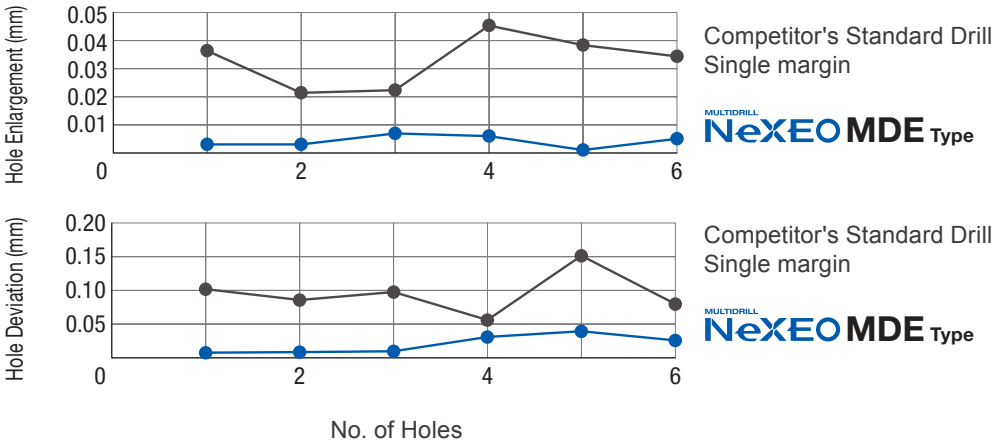
Drills holes with good precision and high quality

Special double margin for good hole precision (internal coolant supply)



Internal Coolant Supply: Double Margin

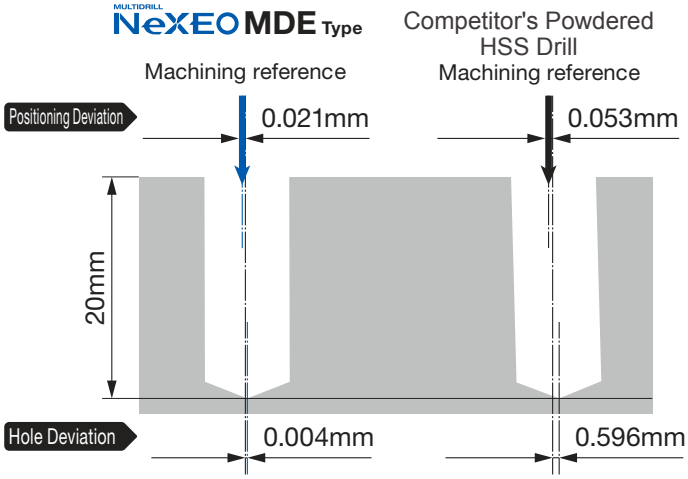
■ Comparison of hole precision (die steel drilling)



Work Material: DH31S (49HRC), Tool: MDE0800S08H05 (Ø 8 mm x5D) with hole
Cutting Data: v_c = 17 m/min, f = 0,07 mm/rev, internal coolant supply (water soluble)

External Coolant Supply: Single Margin

■ Compared to powdered HSS drill, good hole precision (die steel drilling)

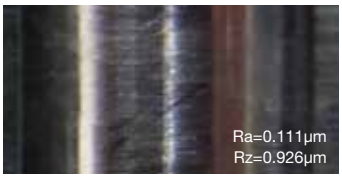


Good hole position accuracy
Minimal hole deviation

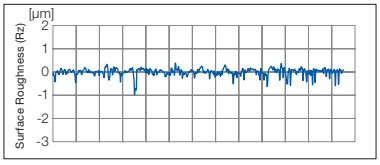
Work Material:	NAK55
Tool:	MDE 0680S07E04 (Ø 6,8 mm x 4D)
Cutting Data:	v_c = 50 m/min
	F = 0,1 mm/rev
	H = 20 mm
	External coolant supply (water soluble)

■ Comparison of hole wall

MULTIDRILL NeXEO MDE Type

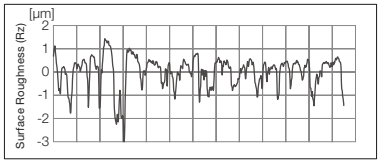


Shiny and good



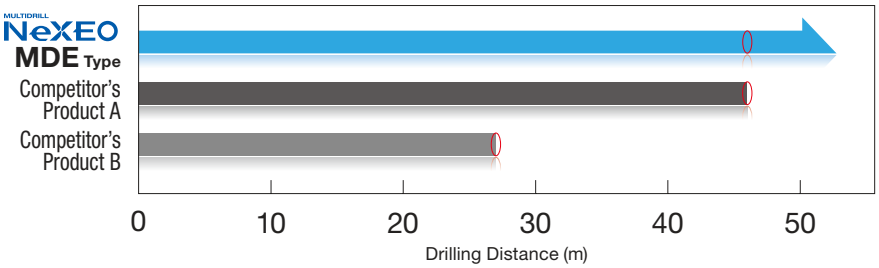
Competitor's Powdered HSS Drill

Cloudiness due to blemishes



■ Application Example: High Carbon Steel

ACT100 grade achieves high wear resistance and peripheral edge breakage resistance



MULTIDRILL NeXEO MDE Type

After drilling 46m

Competitor's Product A

After drilling 46m

Competitor's Product B

After drilling 27m

Work Material: S50C, Machine: BT30 vertical machining centre
Tool: MDE 0800S08H05 (ø8mm×5D) with hole
Cutting Conditions: v_c=80 m/min, f=0.15 mm/rev, H=38 mm (through), internal coolant supply (water soluble)

■ Application Example: Low Carbon Steel

Good chip control in low carbon steel drilling

MULTIDRILL NeXEO MDE Type

Chips are cut into fine pieces

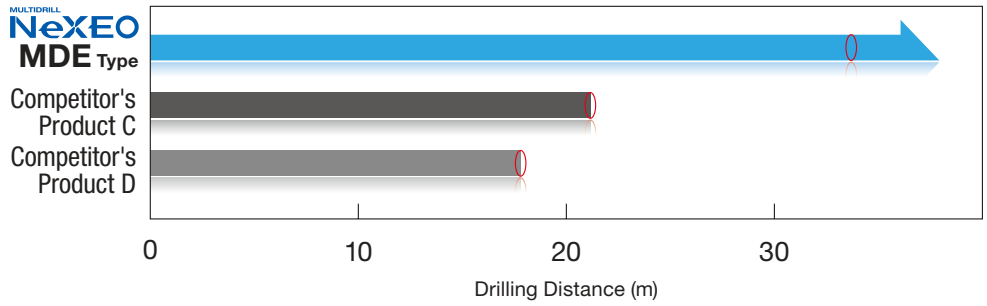
Conventional Product A

Long chips

Work Material: SM material (machine tools frame parts), Machine: Large bridge-type M/C
Tool: MDE 1150S12H05 (ø11.5mm×5D) with hole
Cutting Conditions: v_c=100 m/min, f=0.25 mm/rev, internal coolant supply (water soluble), drilling distance: approx. 20 m pre 30 min

Application Example: Ultra-hard Alloy Steel

Grade ACT100 and new edge design prevent workpiece adhesion chipping

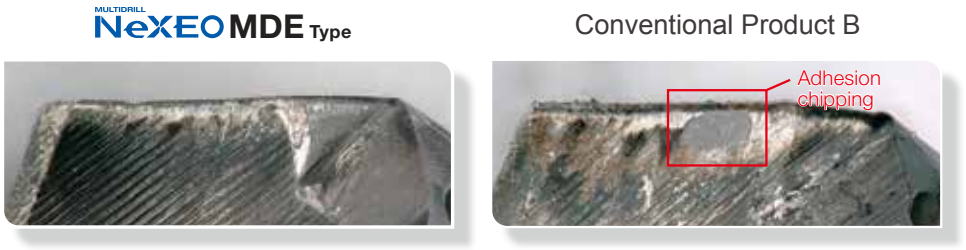


After drilling 34m Small adhesion | After drilling 21m | After drilling 18m

Work Material: 15CrMo5, Machine: BT30 vertical machining centre
Tool: MDE 0800S08H05 (ø8mm×5D) with hole
Cutting Conditions: v_c=80 m/min, f=0.15 mm/rev, H=40 mm (through), internal coolant supply (water soluble)

Application Example: Stainless Steel

Stable drilling of stainless steel on a lathe



Work Material: SUS310, Machine: NC lathe (rotating work material)
Tool: MDE 0350S04H05 (ø3.5mm×5D) with hole
Cutting Conditions: v_c=40 m/min, f=0.05 mm/rev, H=14 mm, internal coolant supply (non-water-sluble), No. of workpieces 5,000

Application Example: Ductile Cast Iron

NX coating reduces margin damage and rake face wear

Work Material: FCD450, Machine: M/C HSK63
Tool: MDE 079S08H05 (ø7.9 mm×5D) with hole
Cutting Conditions: v_c=70 m/min f=0.1 mm/rev, H=40 mm (through), internal coolant supply (water soluble), drilling distance: 64m

Application Example: Frequency of Replacement Compared to Powdered HSS Drill

Long tool life approx. 10 times longer than powdered HSS drill

MULTIDRILL NeXEO MDE Type

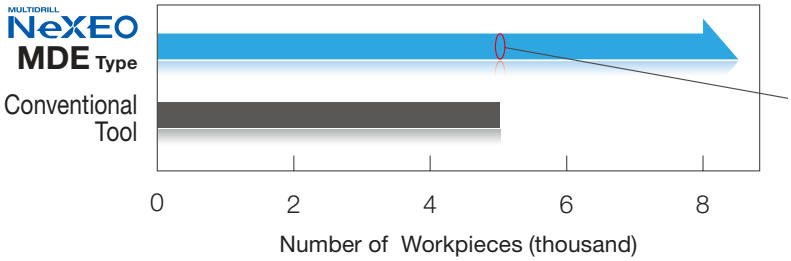
Competitor's Product B: Powdered HSS drill

Material: S15C (automobile parts), Machine: BT30 small machining centre

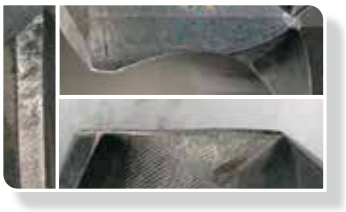
Tool: MDE 0680S07E04 (ø6.8 mm×4D)	Comp's Product B powdered HSS drill (ø6.8 mm×4D)
Cutting Conditions: v_c=60 m/min, f=0.15 mm/rev, external coolant supply (non-water soluble), No. of Workpieces: 12,000 holes	v_c=40 m/min, f=0.15 mm/rev external coolant supply (non-water-soluble), No. of Workpieces: 1,200 holes

Application Example: Stainless Steel, Small Lathe

Low resistance, good chip control and long, stable tool life



MULTIDRILL NeXEO MDE Type



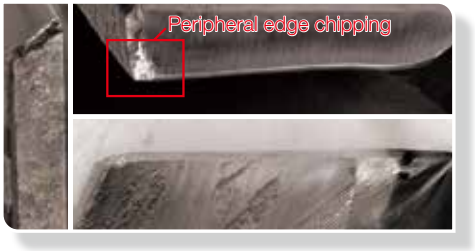
Work Material: SUS316L (95 to 100HRB) (plugs), Machine: Automatic CNC lathe (workpiece rotates)
Tool: MDE 0680S07E2 (ø6.8 mm×2D)
Cutting Conditions: v_c=50 m/min, f=0.09 mm/rev, external coolant supply (non-water-soluble)

Application Example: High Carbon Steel, Small Machining Centre

Achieves long, stable tool life even with low feed drilling of high carbon steel

MULTIDRILL NeXEO MDE Type

Competitor's Product C



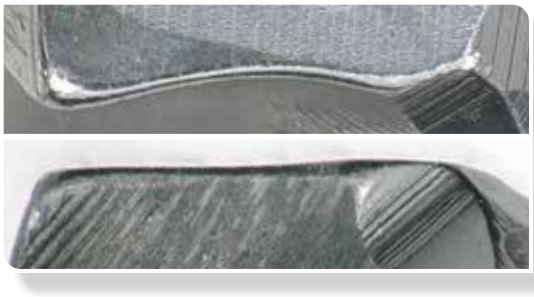
Work Material: S48C, Machine: BT30 small machining centre
Tool: MDE 0830S07E4 (ø8.3 mm×4D)
Cutting Conditions: v_c=30 m/min, f=0.08 mm/rev, external coolant supply (water soluble), No. of Workpieces: 150

■ Series expansion of small diameter drills!

Diameter : ø1,0 mm to 2,9 mm

■ Application Example: Low Carbon Steel

MULTIDRILL NeXEO MDE Type



After drilling 900 holes

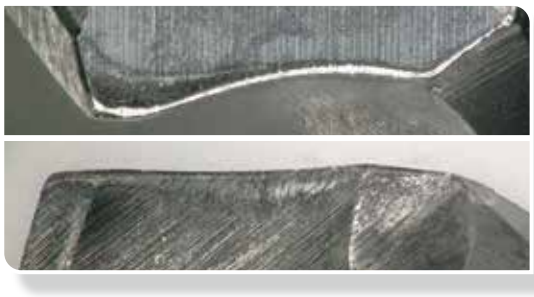
Competitor's Product A

After drilling 900 holes

Work Material: 15CrMo5, Machine: BT30 vertical machining centre
Tool: MDE 0100S03H05 (ø1.0mm×5D) with hole
Cutting Conditions: v_c=40m/min, f=0.04mm/rev, H=5mm (through), internal coolant supply (water soluble)

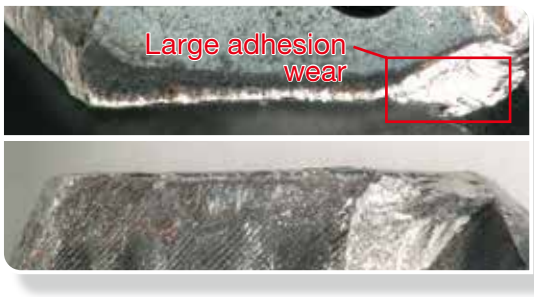
■ Application Example: Stainless Steel

MULTIDRILL NeXEO MDE Type



After drilling 3,840 holes

Conventional Product A



After drilling 3,840 holes

Work Material: SUS304, Machine: BT30 vertical machining centre
Tool: MDE 0200S03H05 (ø2.0mm×5D) with hole
Cutting Conditions: v_c=40m/min, f=0.04mm/rev, H=10mm (through), internal coolant supply (water soluble)

A size for hub processing is available!

Further reduces resistance with overlap thinning, suppressing wear in hub drilling.
Excellent for shallow holes

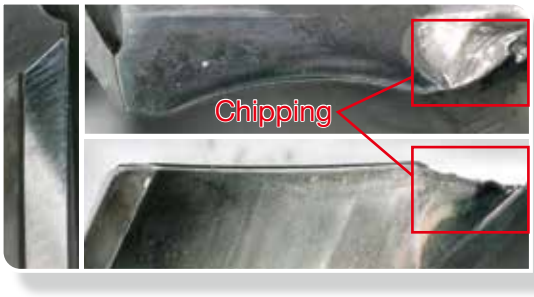
*L/D=2 sizes only

Application Example: Hole for Press-fitting Bolt in Inner Shaft of Hub

MULTIDRILL NeXEO MDE Type

After drilling 2,500 workpieces
(5 holes per workpiece)

Conventional Product B



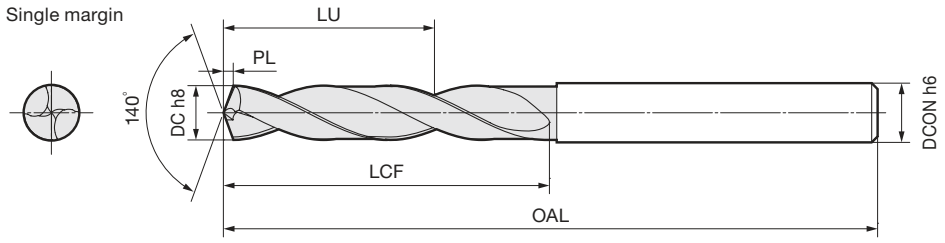
After drilling 1,000 workpieces
(5 holes per workpiece)

Work Material: equivalent to S55C, Machine: Vertical machining centre
Tool: MDE 1397S14E02H (ø13.97mm×2D)
Cutting Conditions: v_c=75m/min, f=0.2mm/rev, H=15mm (through), external coolant supply (water solube)

MDE-E Type (External Coolant Supply)

Carbon Steel, Alloy Steel		Tempered Steel	Hardened Steel		Stainless Steel	Ti Alloy	Heat-resistant Steel	Cast Iron	Ductile Cast Iron	Aluminum Alloy	Copper Alloy	Composite CFRP
Up to 0.25%	From 0.25%		Up to 45HRC	From 45HRC								
○	◎	◎	○		○	○	○	◎	◎			

NX Coat 2D 4D



Diameter: Ø1,0 to 3,0 mm

Diameter DC (mm)	Hole Depth (LD)	Stock	Cat. No.	Dimensions (mm)				
				Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON
1,0	2	●	MDE 0100S03E02	5,7	7,2	45,2	0,2	3,0
	4	●	MDE 0100S03E04	7,7	9,2	49,2	0,2	3,0
1,1	2	●	MDE 0110S03E02	5,6	7,2	45,2	0,2	3,0
	4	●	MDE 0110S03E04	7,6	9,2	49,2	0,2	3,0
1,2	2	●	MDE 0120S03E02	6,4	8,2	45,2	0,2	3,0
	4	●	MDE 0120S03E04	8,4	10,2	49,2	0,2	3,0
1,3	2	●	MDE 0130S03E02	6,3	8,2	45,2	0,2	3,0
	4	●	MDE 0130S03E04	9,3	11,2	49,2	0,2	3,0
1,4	2	●	MDE 0140S03E02	7,2	9,3	45,3	0,3	3,0
	4	●	MDE 0140S03E04	9,2	11,3	49,3	0,3	3,0
1,5	2	●	MDE 0150S03E02	7,1	9,3	45,3	0,3	3,0
	4	●	MDE 0150S03E04	10,1	12,3	49,3	0,3	3,0
1,6	2	●	MDE 0160S03E02	7,9	10,3	45,3	0,3	3,0
	4	●	MDE 0160S03E04	10,9	13,3	49,3	0,3	3,0
1,7	2	●	MDE 0170S03E02	7,8	10,3	45,3	0,3	3,0
	4	●	MDE 0170S03E04	10,8	13,3	49,3	0,3	3,0
1,8	2	●	MDE 0180S03E02	8,6	11,3	45,3	0,3	3,0
	4	●	MDE 0180S03E04	11,6	14,3	49,3	0,3	3,0
1,9	2	●	MDE 0190S03E02	8,5	11,3	45,3	0,3	3,0
	4	●	MDE 0190S03E04	12,5	15,3	49,3	0,3	3,0
2,0	2	●	MDE 0200S03E02	9,4	12,4	45,4	0,4	3,0
	4	●	MDE 0200S03E04	13,4	16,4	49,4	0,4	3,0
2,1	2	●	MDE 0210S03E02	9,3	12,4	45,4	0,4	3,0
	4	●	MDE 0210S03E04	13,3	16,4	49,4	0,4	3,0
2,2	2	●	MDE 0220S03E02	10,1	13,4	45,4	0,4	3,0
	4	●	MDE 0220S03E04	14,1	17,4	49,4	0,4	3,0
2,3	2	●	MDE 0230S03E02	10,0	13,4	45,4	0,4	3,0
	4	●	MDE 0230S03E04	14,0	17,4	49,4	0,4	3,0
2,4	2	●	MDE 0240S03E02	10,8	14,4	45,4	0,4	3,0
	4	●	MDE 0240S03E04	14,8	18,4	49,4	0,4	3,0
2,5	2	●	MDE 0250S03E02	10,8	14,5	45,5	0,5	3,0
	4	●	MDE 0250S03E04	14,8	18,5	49,5	0,5	3,0
2,6	2	●	MDE 0260S03E02	11,6	15,5	45,5	0,5	3,0
	4	●	MDE 0260S03E04	15,6	19,5	49,5	0,5	3,0
2,7	2	●	MDE 0270S03E02	11,5	15,5	45,5	0,5	3,0
	4	●	MDE 0270S03E04	15,5	19,5	49,5	0,5	3,0
2,76	2	●	MDE 0276S03E02	11,3	15,5	45,5	0,5	3,0
2,78	2	●	MDE 0278S03E02	11,3	15,5	45,5	0,5	3,0
2,8	2	●	MDE 0280S03E02	11,3	15,5	45,5	0,5	3,0
	4	●	MDE 0280S03E04	15,3	19,5	49,5	0,5	3,0
2,9	2	●	MDE 0290S03E02	11,2	15,5	45,5	0,5	3,0
	4	●	MDE 0290S03E04	15,2	19,5	49,5	0,5	3,0
3,0	2	●	MDE 0300S03E02	9,0	13,5	45,5	0,5	3,0
	4	●	MDE 0300S03E04	15,0	19,5	49,5	0,5	3,0

Grade ACT100

Diameter: Ø3,0 to 5,0 mm

Diameter DC (mm)	Hole Depth (LD)	Stock	Cat. No.	Dimensions (mm)				
				Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON
3.1	2	❍	MDE 0310S04E02	15.0	19.6	54.6	0.6	4.0
	4	❍	MDE 0310S04E04	20.0	24.6	60.6	0,6	4,0
3.2	2	❍	MDE 0320S04E02	14.8	19.6	54.6	0.6	4.0
	4	❍	MDE 0320S04E04	19.8	24.6	60.6	0.6	4.0
3.3	2	❍	MDE 0330S04E02	14.7	19.6	54.6	0.6	4.0
	4	❍	MDE 0330S04E04	19.7	24.6	60.6	0.6	4.0
3.4	2	❍	MDE 0340S04E02	14.5	19.6	54.6	0.6	4.0
	4	❍	MDE 0340S04E04	19.5	24.6	60.6	0.6	4.0
3.5	2	❍	MDE 0350S04E02	14.4	19.6	54.6	0.6	4.0
	4	❍	MDE 0350S04E04	19.4	24.6	60.6	0.6	4.0
3.6	2	❍	MDE 0360S04E02	16.3	21.7	54.7	0.7	4.0
	4	❍	MDE 0360S04E04	22.3	27.7	60.7	0.7	4.0
3.66	2	❍	MDE 0366S04E02	16.2	21.7	54.7	0.7	4.0
3.68	2	❍	MDE 0368S04E02	16.2	21.7	54.7	0.7	4.0
3.7	2	❍	MDE 0370S04E02	16.2	21.7	54.7	0.7	4.0
	4	❍	MDE 0370S04E04	22.2	27.7	60.7	0.7	4.0
3.8	2	❍	MDE 0380S04E02	16.0	21.7	54.7	0.7	4.0
	4	❍	MDE 0380S04E04	22.0	27.7	60.7	0.7	4.0
3.9	2	❍	MDE 0390S04E02	15.9	21.7	54.7	0.7	4.0
	4	❍	MDE 0390S04E04	21.9	27.7	60.7	0.7	4.0
4.0	2	❍	MDE 0400S04E02	15.7	21.7	54.7	0.7	4.0
	4	❍	MDE 0400S04E04	21.7	27.7	60.7	0.7	4.0
4.1	2	❍	MDE 0410S05E02	17.6	23.7	61.7	0.7	5.0
	4	❍	MDE 0410S05E04	25.6	31.7	76.7	0.7	5.0
4.2	2	❍	MDE 0420S05E02	17.5	23.8	61.8	0.8	5.0
	4	❍	MDE 0420S05E04	25.5	31.8	76.8	0.8	5.0
4.3	2	❍	MDE 0430S05E02	17.4	23.8	61.8	0.8	5.0
	4	❍	MDE 0430S05E04	25.4	31.8	76.8	0.8	5.0
4.4	2	❍	MDE 0440S05E02	17.2	23.8	61.8	0.8	5.0
	4	❍	MDE 0440S05E04	25.2	31.8	76.8	0.8	5.0
4.5	2	❍	MDE 0450S05E02	17.1	23.8	61.8	0.8	5.0
	4	❍	MDE 0450S05E04	25.1	31.8	76.8	0.8	5.0
4.6	2	❍	MDE 0460S05E02	18.9	25.8	61.8	0.8	5.0
	4	❍	MDE 0460S05E04	31.9	38.8	76.8	0.8	5.0
4.62	2	❍	MDE 0462S05E02	18.9	25.8	61.8	0.8	5.0
4.64	2	❍	MDE 0464S05E02	18.9	25.8	61.8	0.8	5.0
4.7	2	❍	MDE 0470S05E02	18.9	25.9	61.9	0.9	5.0
	4	❍	MDE 0470S05E04	31.9	38.9	76.9	0.9	5.0
4.8	2	❍	MDE 0480S05E02	18.7	25.9	61.9	0.9	5.0
	4	❍	MDE 0480S05E04	31.7	38.9	76.9	0.9	5.0
4.9	2	❍	MDE 0490S05E02	18.6	25.9	61.9	0.9	5.0
	4	❍	MDE 0490S05E04	31.6	38.9	76.9	0.9	5.0
5.0	2	❍	MDE 0500S05E02	18.4	25.9	61.9	0.9	5.0
	4	❍	MDE 0500S05E04	31.4	38.9	76.9	0.9	5.0

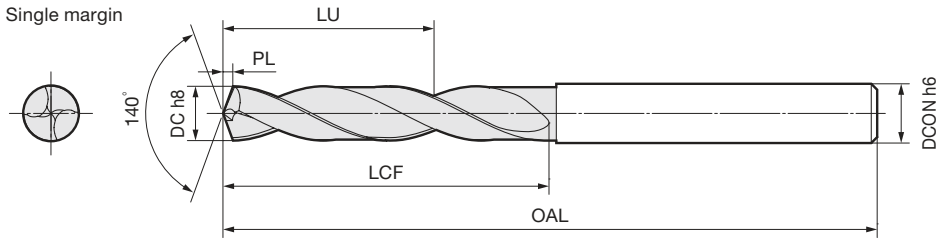
Grade ACT100

❍= Japan stock ● = Euro stock

MDE-E Type (External Coolant Supply)

Carbon Steel, Alloy Steel		Tempered Steel	Hardened Steel		Stainless Steel	Ti Alloy	Heat-resistant Steel	Cast Iron	Ductile Cast Iron	Aluminum Alloy	Copper Alloy	Composite CFRP
Up to 0.28%	From 0.29%		Up to 45HRC	From 45HRC								
○	◎	◎	○		○	○	○	◎	◎			

NX Coat 2D 4D



Diameter: ø5.1 to 7.1 mm

Diameter DC (mm)	Hole Depth (LD)	Stock	Cat. No.	Dimensions (mm) Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON
5.1	2	❍	MDE 0510S06E02	18.3	25.9	65.9	0.9	6.0
	4	❍	MDE 0510S06E04	32.3	39.9	81.9	0.9	6.0
5.2	2	❍	MDE 0520S06E02	18.1	25.9	65.9	0.9	6.0
	4	❍	MDE 0520S06E04	32.1	39.9	81.9	0.9	6.0
5.3	2	❍	MDE 0530S06E02	18.1	26.0	66.0	1.0	6.0
	4	❍	MDE 0530S06E04	32.1	40.0	82.0	1.0	6.0
5.4	2	❍	MDE 0540S06E02	17.9	26.0	66.0	1.0	6.0
	4	❍	MDE 0540S06E04	31.9	40.0	82.0	1.0	6.0
5.5	2	❍	MDE 0550S06E02	17.8	26.0	66.0	1.0	6.0
	4	❍	MDE 0550S06E04	31.8	40.0	82.0	1.0	6.0
5.52	2	❍	MDE 0552S06E02	19.6	28.0	66.0	1.0	6.0
5.54	2	❍	MDE 0554S06E02	19.6	28.0	66.0	1.0	6.0
5.6	2	❍	MDE 0560S06E02	19.6	28.0	66.0	1.0	6.0
	4	❍	MDE 0560S06E04	33.6	42.0	82.0	1.0	6.0
5.7	2	❍	MDE 0570S06E02	19.5	28.0	66.0	1.0	6.0
	4	❍	MDE 0570S06E04	33.5	42.0	82.0	1.0	6.0
5.8	2	❍	MDE 0580S06E02	19.4	28.1	66.1	1.1	6.0
	4	❍	MDE 0580S06E04	33.4	42.1	82.1	1.1	6.0
5.9	2	❍	MDE 0590S06E02	19.3	28.1	66.1	1.1	6.0
	4	❍	MDE 0590S06E04	33.3	42.1	82.1	1.1	6.0
6.0	2	❍	MDE 0600S06E02	19.1	28.1	66.1	1.1	6.0
	4	❍	MDE 0600S06E04	33.1	42.1	82.1	1.1	6.0
6.1	2	❍	MDE 0610S07E02	23.0	32.1	74.1	1.1	7.0
	4	❍	MDE 0610S07E04	34.0	43.1	84.1	1.1	7.0
6.2	2	❍	MDE 0620S07E02	22.8	32.1	74.1	1.1	7.0
	4	❍	MDE 0620S07E04	33.8	43.1	84.1	1.1	7.0
6.3	2	❍	MDE 0630S07E02	22.7	32.1	74.1	1.1	7.0
	4	❍	MDE 0630S07E04	33.7	43.1	84.1	1.1	7.0
6.4	2	❍	MDE 0640S07E02	22.6	32.2	74.2	1.2	7.0
	4	❍	MDE 0640S07E04	33.6	43.2	84.2	1.2	7.0
6.5	2	❍	MDE 0650S07E02	22.5	32.2	74.2	1.2	7.0
	4	❍	MDE 0650S07E04	33.5	43.2	84.2	1.2	7.0
6.6	2	❍	MDE 0660S07E02	24.3	34.2	74.2	1.2	7.0
	4	❍	MDE 0660S07E04	34.3	44.2	84.2	1.2	7.0
6.7	2	❍	MDE 0670S07E02	24.2	34.2	74.2	1.2	7.0
	4	❍	MDE 0670S07E04	34.2	44.2	84.2	1.2	7.0
6.8	2	❍	MDE 0680S07E02	24.0	34.2	74.2	1.2	7.0
	4	❍	MDE 0680S07E04	34.0	44.2	84.2	1.2	7.0
6.9	2	❍	MDE 0690S07E02	24.0	34.3	74.3	1.3	7.0
	4	❍	MDE 0690S07E04	34.0	44.3	84.3	1.3	7.0
7.0	2	❍	MDE 0700S07E02	23.8	34.3	74.3	1.3	7.0
	4	❍	MDE 0700S07E04	33.8	44.3	84.3	1.3	7.0
7.1	2	❍	MDE 0710S08E02	23.7	34.3	79.3	1.3	8.0
	4	❍	MDE 0710S08E04	35.7	46.3	91.3	1.3	8.0

Grade ACT100

Diameter: ø7.2 to 9.1 mm

Diameter DC (mm)	Hole Depth (LD)	Stock	Cat. No.	Dimensions (mm) Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON
7.2	2	❍	MDE 0720S08E02	23.5	34.3	79.3	1.3	8.0
	4	❍	MDE 0720S08E04	35.5	46.3	91.3	1.3	8.0
7.3	2	❍	MDE 0730S08E02	23.4	34.3	79.3	1.3	8.0
	4	❍	MDE 0730S08E04	35.4	46.3	91.3	1.3	8.0
7.36	2	❍	MDE 0736S08E02	23.2	34.3	79.3	1.3	8.0
7.38	2	❍	MDE 0738S08E02	23.2	34.3	79.3	1.3	8.0
7.4	2	❍	MDE 0740S08E02	23.2	34.3	79.3	1.3	8.0
	4	❍	MDE 0740S08E04	35.2	46.3	91.3	1.3	8.0
7.5	2	❍	MDE 0750S08E02	23.2	34.4	79.4	1.4	8.0
	4	❍	MDE 0750S08E04	35.2	46.4	91.4	1.4	8.0
7.52	2	❍	MDE 0752S08E02	26.0	37.4	79.4	1.4	8.0
7.54	2	❍	MDE 0754S08E02	26.0	37.4	79.4	1.4	8.0
7.6	2	❍	MDE 0760S08E02	26.0	37.4	79.4	1.4	8.0
	4	❍	MDE 0760S08E04	38.0	49.4	91.4	1.4	8.0
7.7	2	❍	MDE 0770S08E02	25.9	37.4	79.4	1.4	8.0
	4	❍	MDE 0770S08E04	37.9	49.4	91.4	1.4	8.0
7.8	2	❍	MDE 0780S08E02	25.7	37.4	79.4	1.4	8.0
	4	❍	MDE 0780S08E04	37.7	49.4	91.4	1.4	8.0
7.9	2	❍	MDE 0790S08E02	25.6	37.4	79.4	1.4	8.0
	4	❍	MDE 0790S08E04	37.6	49.4	91.4	1.4	8.0
8.0	2	❍	MDE 0800S08E02	25.5	37.5	79.5	1.5	8.0
	4	❍	MDE 0800S08E04	37.5	49.5	91.5	1.5	8.0
8.1	2	❍	MDE 0810S09E02	25.4	37.5	83.5	1.5	9.0
	4	❍	MDE 0810S09E04	42.4	54.5	99.5	1.5	9.0
8.2	2	❍	MDE 0820S09E02	25.2	37.5	83.5	1.5	9.0
	4	❍	MDE 0820S09E04	42.2	54.5	99.5	1.5	9.0
8.3	2	❍	MDE 0830S09E02	25.1	37.5	83.5	1.5	9.0
	4	❍	MDE 0830S09E04	42.1	54.5	99.5	1.5	9.0
8.4	2	❍	MDE 0840S09E02	24.9	37.5	83.5	1.5	9.0
	4	❍	MDE 0840S09E04	41.9	54.5	99.5	1.5	9.0
8.5	2	❍	MDE 0850S09E02	24.8	37.5	83.5	1.5	9.0
	4	❍	MDE 0850S09E04	41.8	54.5	99.5	1.5	9.0
8.6	2	❍	MDE 0860S09E02	26.7	39.6	83.6	1.6	9.0
	4	❍	MDE 0860S09E04	43.7	56.6	99.6	1.6	9.0
8.7	2	❍	MDE 0870S09E02	26.6	39.6	83.6	1.6	9.0
	4	❍	MDE 0870S09E04	43.6	56.6	99.6	1.6	9.0
8.8	2	❍	MDE 0880S09E02	26.4	39.6	83.6	1.6	9.0
	4	❍	MDE 0880S09E04	43.4	56.6	99.6	1.6	9.0
8.9	2	❍	MDE 0890S09E02	26.3	39.6	83.6	1.6	9.0
	4	❍	MDE 0890S09E04	43.3	56.6	99.6	1.6	9.0
9.0	2	❍	MDE 0900S09E02	26.1	39.6	83.6	1.6	9.0
	4	❍	MDE 0900S09E04	43.1	56.6	99.6	1.6	9.0
9.1	2	❍	MDE 0910S10E02	26.1	39.7	88.7	1.7	10.0
	4	❍	MDE 0910S10E04	46.1	59.7	106.7	1.7	10.0

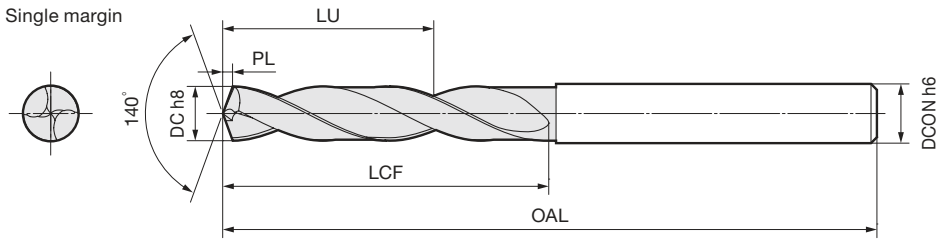
Grade ACT100

❍= Japan stock ● = Euro stock

MDE-E Type (External Coolant Supply)

Carbon Steel, Alloy Steel		Tempered Steel	Hardened Steel		Stainless Steel	Ti Alloy	Heat-resistant Steel	Cast Iron	Ductile Cast Iron	Aluminum Alloy	Copper Alloy	Composite CFRP
Up to 0.28%	From 0.29%		Up to 45HRC	From 46HRC								
○	◎	◎	○		○	○	○	◎	◎			

NX Coat 2D 4D



Diameter: ø9.2 to 11.0 mm

Diameter DC (mm)	Hole Depth (LD)	Stock	Cat. No.	Dimensions (mm)				
				Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON
9.2	2	❍	MDE 0920S10E02	25.9	39.7	88.7	1.7	10.0
	4	❍	MDE 0920S10E04	45.9	59.7	106.7	1.7	10.0
9.24	2	❍	MDE 0924S10E02	25.8	39.7	88.7	1.7	10.0
9.26	2	❍	MDE 0926S10E02	25.8	39.7	88.7	1.7	10.0
9.3	2	❍	MDE 0930S10E02	25.8	39.7	88.7	1.7	10.0
	4	❍	MDE 0930S10E04	45.8	59.7	106.7	1.7	10.0
9.36	2	❍	MDE 0936S10E02	25.6	39.7	88.7	1.7	10.0
9.38	2	❍	MDE 0938S10E02	25.6	39.7	88.7	1.7	10.0
9.4	2	❍	MDE 0940S10E02	25.6	39.7	88.7	1.7	10.0
	4	❍	MDE 0940S10E04	45.6	59.7	106.7	1.7	10.0
9.5	2	❍	MDE 0950S10E02	25.5	39.7	88.7	1.7	10.0
	4	❍	MDE 0950S10E04	45.5	59.7	106.7	1.7	10.0
9.52	2	❍	MDE 0952S10E02	28.3	42.7	88.7	1.7	10.0
9.54	2	❍	MDE 0954S10E02	28.3	42.7	88.7	1.7	10.0
9.6	2	❍	MDE 0960S10E02	28.3	42.7	88.7	1.7	10.0
	4	❍	MDE 0960S10E04	47.3	61.7	106.7	1.7	10.0
9.7	2	❍	MDE 0970S10E02	28.3	42.8	88.8	1.8	10.0
	4	❍	MDE 0970S10E04	47.3	61.8	106.8	1.8	10.0
9.8	2	❍	MDE 0980S10E02	28.1	42.8	88.8	1.8	10.0
	4	❍	MDE 0980S10E04	47.1	61.8	106.8	1.8	10.0
9.9	2	❍	MDE 0990S10E02	28.0	42.8	88.8	1.8	10.0
	4	❍	MDE 0990S10E04	47.0	61.8	106.8	1.8	10.0
10.0	2	❍	MDE 1000S10E02	27.8	42.8	88.8	1.8	10.0
	4	❍	MDE 1000S10E04	46.8	61.8	106.8	1.8	10.0
10.1	2	❍	MDE 1010S11E02	27.7	42.8	94.8	1.8	11.0
	4	❍	MDE 1010S11E04	52.7	67.8	115.8	1.8	11.0
10.2	2	❍	MDE 1020S11E02	27.6	42.9	94.9	1.9	11.0
	4	❍	MDE 1020S11E04	52.6	67.9	115.9	1.9	11.0
10.3	2	❍	MDE 1030S11E02	27.5	42.9	94.9	1.9	11.0
	4	❍	MDE 1030S11E04	52.5	67.9	115.9	1.9	11.0
10.4	2	❍	MDE 1040S11E02	27.3	42.9	94.9	1.9	11.0
	4	❍	MDE 1040S11E04	52.3	67.9	115.9	1.9	11.0
10.5	2	❍	MDE 1050S11E02	27.2	42.9	94.9	1.9	11.0
	4	❍	MDE 1050S11E04	52.2	67.9	115.9	1.9	11.0
10.6	2	❍	MDE 1060S11E02	31.0	46.9	94.9	1.9	11.0
	4	❍	MDE 1060S11E04	54.0	69.9	115.9	1.9	11.0
10.7	2	❍	MDE 1070S11E02	30.9	46.9	94.9	1.9	11.0
	4	❍	MDE 1070S11E04	53.9	69.9	115.9	1.9	11.0
10.8	2	❍	MDE 1080S11E02	30.8	47.0	95.0	2.0	11.0
	4	❍	MDE 1080S11E04	53.8	70.0	116.0	2.0	11.0
10.9	2	❍	MDE 1090S11E02	30.7	47.0	95.0	2.0	11.0
	4	❍	MDE 1090S11E04	53.7	70.0	116.0	2.0	11.0
11.0	2	❍	MDE 1100S11E02	30.5	47.0	95.0	2.0	11.0
	4	❍	MDE 1100S11E04	53.5	70.0	116.0	2.0	11.0

Grade ACT100

Diameter: ø11.1 to 13.0 mm

Diameter DC (mm)	Hole Depth (LD)	Stock	Cat. No.	Dimensions (mm)				
				Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON
11.1	2	❍	MDE 1110S12E02	30.4	47.0	102.0	2.0	12.0
	4	❍	MDE 1110S12E04	56.4	73.0	123.0	2.0	12.0
11.2	2	❍	MDE 1120S12E02	30.2	47.0	102.0	2.0	12.0
	4	❍	MDE 1120S12E04	56.2	73.0	123.0	2.0	12.0
11.22	2	❍	MDE 1122S12E02	30.2	47.0	102.0	2.0	12.0
11.24	2	❍	MDE 1124S12E02	30.2	47.0	102.0	2.0	12.0
11.3	2	❍	MDE 1130S12E02	30.2	47.1	102.1	2.1	12.0
	4	❍	MDE 1130S12E04	56.2	73.1	123.1	2.1	12.0
11.36	2	❍	MDE 1136S12E02	30.0	47.1	102.1	2.1	12.0
11.38	2	❍	MDE 1138S12E02	30.0	47.1	102.1	2.1	12.0
11.4	2	❍	MDE 1140S12E02	30.0	47.1	102.1	2.1	12.0
	4	❍	MDE 1140S12E04	56.0	73.1	123.1	2.1	12.0
11.5	2	❍	MDE 1150S12E02	29.9	47.1	102.1	2.1	12.0
	4	❍	MDE 1150S12E04	55.9	73.1	123.1	2.1	12.0
11.6	2	❍	MDE 1160S12E02	31.7	49.1	102.1	2.1	12.0
	4	❍	MDE 1160S12E04	57.7	75.1	123.1	2.1	12.0
11.7	2	❍	MDE 1170S12E02	31.6	49.1	102.1	2.1	12.0
	4	❍	MDE 1170S12E04	57.6	75.1	123.1	2.1	12.0
11.8	2	❍	MDE 1180S12E02	31.4	49.1	102.1	2.1	12.0
	4	❍	MDE 1180S12E04	57.4	75.1	123.1	2.1	12.0
11.9	2	❍	MDE 1190S12E02	31.4	49.2	102.2	2.2	12.0
	4	❍	MDE 1190S12E04	57.4	75.2	123.2	2.2	12.0
12.0	2	❍	MDE 1200S12E02	31.2	49.2	102.2	2.2	12.0
	4	❍	MDE 1200S12E04	57.2	75.2	123.2	2.2	12.0
12.1	2	❍	MDE 1210S13E02	31.1	49.2	102.2	2.2	13.0
	4	❍	MDE 1210S13E04	60.1	78.2	139.2	2.2	13.0
12.2	2	❍	MDE 1220S13E02	30.9	49.2	102.2	2.2	13.0
	4	❍	MDE 1220S13E04	59.9	78.2	139.2	2.2	13.0
12.3	2	❍	MDE 1230S13E02	30.8	49.2	102.2	2.2	13.0
	4	❍	MDE 1230S13E04	59.8	78.2	139.2	2.2	13.0
12.4	2	❍	MDE 1240S13E02	30.7	49.3	102.3	2.3	13.0
	4	❍	MDE 1240S13E04	59.7	78.3	139.3	2.3	13.0
12.5	2	❍	MDE 1250S13E02	30.6	49.3	102.3	2.3	13.0
	4	❍	MDE 1250S13E04	59.6	78.3	139.3	2.3	13.0
12.6	2	❍	MDE 1260S13E02	32.4	51.3	102.3	2.3	13.0
	4	❍	MDE 1260S13E04	61.4	80.3	139.3	2.3	13.0
12.7	2	❍	MDE 1270S13E02	32.3	51.3	102.3	2.3	13.0
	4	❍	MDE 1270S13E04	61.3	80.3	139.3	2.3	13.0
12.8	2	❍	MDE 1280S13E02	32.1	51.3	102.3	2.3	13.0
	4	❍	MDE 1280S13E04	61.1	80.3	139.3	2.3	13.0
12.9	2	❍	MDE 1290S13E02	32.0	51.3	102.3	2.3	13.0
	4	❍	MDE 1290S13E04	61.0	80.3	139.3	2.3	13.0
13.0	2	❍	MDE 1300S13E02	31.9	51.4	102.4	2.4	13.0
	4	❍	MDE 1300S13E04	60.9	80.4	139.4	2.4	13.0

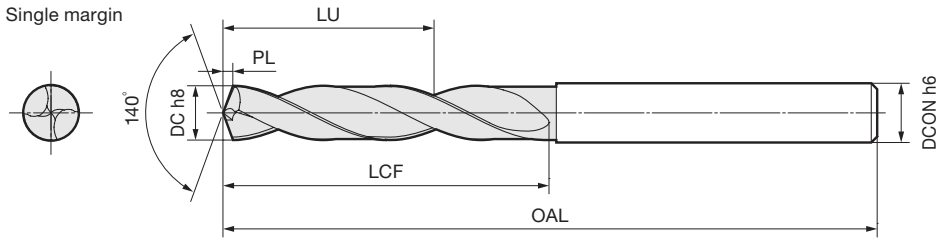
Grade ACT100

❍= Japan stock ● = Euro stock

MDE-E Type (External Coolant Supply)

Carbon Steel, Alloy Steel		Tempered Steel	Hardened Steel		Stainless Steel	Ti Alloy	Heat-resistant Steel	Cast Iron	Ductile Cast Iron	Aluminum Alloy	Copper Alloy	Composite CFRP
Up to 0.26%	From 0.29%		Up to 45HRC	From 45HRC								
○	◎	◎	○		○	○	○	◎	◎			

NX Coat 2D 4D



Diameter DC (mm)	Hole Depth (LD)	Stock	Cat. No.	Dimensions (mm) Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON
13.1	2	❍	MDE 1310S14E02	32.8	52.4	107.4	2.4	14.0
	4	❍	MDE 1310S14E04	66.8	86.4	149.4	2.4	14.0
13.2	2	❍	MDE 1320S14E02	32.6	52.4	107.4	2.4	14.0
	4	❍	MDE 1320S14E04	66.6	86.4	149.4	2.4	14.0
13.3	2	❍	MDE 1330S14E02	32.5	52.4	107.4	2.4	14.0
	4	❍	MDE 1330S14E04	66.5	86.4	149.4	2.4	14.0
13.4	2	❍	MDE 1340S14E02	32.3	52.4	107.4	2.4	14.0
	4	❍	MDE 1340S14E04	66.3	86.4	149.4	2.4	14.0
13.5	2	❍	MDE 1350S14E02	32.3	52.5	107.5	2.5	14.0
	4	❍	MDE 1350S14E04	66.3	86.5	149.5	2.5	14.0
13.6	2	❍	MDE 1360S14E02	34.1	54.5	107.5	2.5	14.0
	4	❍	MDE 1360S14E04	68.1	88.5	149.5	2.5	14.0
13.7	2	❍	MDE 1370S14E02	34.0	54.5	107.5	2.5	14.0
	4	❍	MDE 1370S14E04	68.0	88.5	149.5	2.5	14.0
13.8	2	❍	MDE 1380S14E02	33.8	54.5	107.5	2.5	14.0
	4	❍	MDE 1380S14E04	67.8	88.5	149.5	2.5	14.0
13.9	2	❍	MDE 1390S14E02	33.7	54.5	107.5	2.5	14.0
	4	❍	MDE 1390S14E04	67.7	88.5	149.5	2.5	14.0
14.0	2	❍	MDE 1400S14E02	33.5	54.5	107.5	2.5	14.0
	4	❍	MDE 1400S14E04	67.5	88.5	149.5	2.5	14.0
14.1	2	❍	MDE 1410S15E02	33.5	54.6	110.6	2.6	15.0
	4	❍	MDE 1410S15E04	70.5	91.6	155.6	2.6	15.0
14.2	2	❍	MDE 1420S15E02	33.3	54.6	110.6	2.6	15.0
	4	❍	MDE 1420S15E04	70.3	91.6	155.6	2.6	15.0
14.3	2	❍	MDE 1430S15E02	33.2	54.6	110.6	2.6	15.0
	4	❍	MDE 1430S15E04	70.2	91.6	155.6	2.6	15.0
14.4	2	❍	MDE 1440S15E02	33.0	54.6	110.6	2.6	15.0
	4	❍	MDE 1440S15E04	70.0	91.6	155.6	2.6	15.0
14.5	2	❍	MDE 1450S15E02	32.9	54.6	110.6	2.6	15.0
	4	❍	MDE 1450S15E04	69.9	91.6	155.6	2.6	15.0
14.6	2	❍	MDE 1460S15E02	33.8	55.7	110.7	2.7	15.0
	4	❍	MDE 1460S15E04	71.8	93.7	155.7	2.7	15.0
14.7	2	❍	MDE 1470S15E02	33.7	55.7	110.7	2.7	15.0
	4	❍	MDE 1470S15E04	71.7	93.7	155.7	2.7	15.0
14.8	2	❍	MDE 1480S15E02	33.5	55.7	110.7	2.7	15.0
	4	❍	MDE 1480S15E04	71.5	93.7	155.7	2.7	15.0
14.9	2	❍	MDE 1490S15E02	33.4	55.7	110.7	2.7	15.0
	4	❍	MDE 1490S15E04	71.4	93.7	155.7	2.7	15.0
15.0	2	❍	MDE 1500S15E02	33.2	55.7	110.7	2.7	15.0
	4	❍	MDE 1500S15E04	71.2	93.7	155.7	2.7	15.0
15.1	2	❍	MDE 1510S16E02	33.1	55.7	114.7	2.7	16.0
	4	❍	MDE 1510S16E04	74.1	96.7	162.7	2.7	16.0
15.2	2	❍	MDE 1520S16E02	33.0	55.8	114.8	2.8	16.0
	4	❍	MDE 1520S16E04	74.0	96.8	162.8	2.8	16.0

Grade ACT100

Diameter: ø15.3 to 20.0 mm

Diameter DC (mm)	Hole Depth (LD)	Stock	Cat. No.	Dimensions (mm) Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON
15.3	2	❍	MDE 1530S16E02	32.9	55.8	114.8	2.8	16.0
	4	❍	MDE 1530S16E04	73.9	96.8	162.8	2.8	16.0
15.4	2	❍	MDE 1540S16E02	32.7	55.8	114.8	2.8	16.0
	4	❍	MDE 1540S16E04	73.7	96.8	162.8	2.8	16.0
15.5	2	❍	MDE 1550S16E02	32.6	55.8	114.8	2.8	16.0
	4	❍	MDE 1550S16E04	73.6	96.8	162.8	2.8	16.0
15.6	2	❍	MDE 1560S16E02	34.4	57.8	114.8	2.8	16.0
	4	❍	MDE 1560S16E04	75.4	98.8	162.8	2.8	16.0
15.7	2	❍	MDE 1570S16E02	34.4	57.9	114.9	2.9	16.0
	4	❍	MDE 1570S16E04	75.4	98.9	162.9	2.9	16.0
15.8	2	❍	MDE 1580S16E02	34.2	57.9	114.9	2.9	16.0
	4	❍	MDE 1580S16E04	75.2	98.9	162.9	2.9	16.0
15.9	2	❍	MDE 1590S16E02	34.1	57.9	114.9	2.9	16.0
	4	❍	MDE 1590S16E04	75.1	98.9	162.9	2.9	16.0
16.0	2	❍	MDE 1600S16E02	33.9	57.9	114.9	2.9	16.0
	4	❍	MDE 1600S16E04	74.9	98.9	162.9	2.9	16.0
16.5	2	❍	MDE 1650S17E02	34.3	59.0	119.0	3.0	17.0
	4	❍	MDE 1650S17E04	76.3	101.0	170.0	3.0	17.0
16.8	4	❍	MDE 1680S17E04	75.9	101.1	170.1	3.1	17.0
17.0	2	❍	MDE 1700S17E02	34.6	60.1	119.1	3.1	17.0
	4	❍	MDE 1700S17E04	75.7	101.2	170.2	3.2	17.0
17.5	2	❍	MDE 1750S18E02	35.0	61.2	123.2	3.2	18.0
	4	❍	MDE 1750S18E04	77.0	103.2	170.2	3.2	18.0
18.0	2	❍	MDE 1800S18E02	35.3	62.3	123.3	3.3	18.0
	4	❍	MDE 1800S18E04	78.3	105.3	170.3	3.3	18.0
18.5	2	❍	MDE 1850S19E02	34.7	62.4	126.4	3.4	19.0
	4	❍	MDE 1850S19E04	79.7	107.4	182.4	3.4	19.0
19.0	2	❍	MDE 1900S19E02	35.0	63.5	126.5	3.5	19.0
	4	❍	MDE 1900S19E04	80.9	109.4	182.4	3.4	19.0
19.5	2	❍	MDE 1950S20E02	35.3	64.5	130.5	3.5	20.0
	4	❍	MDE 1950S20E04	84.3	113.5	182.5	3.5	20.0
19.7	4	❍	MDE 1970S20E04	88.1	117.6	182.6	3.6	20.0
20.0	2	❍	MDE 2000S20E02	35.6	65.6	130.6	3.6	20.0
	4	❍	MDE 2000S20E04	87.6	117.6	182.6	3.6	20.0

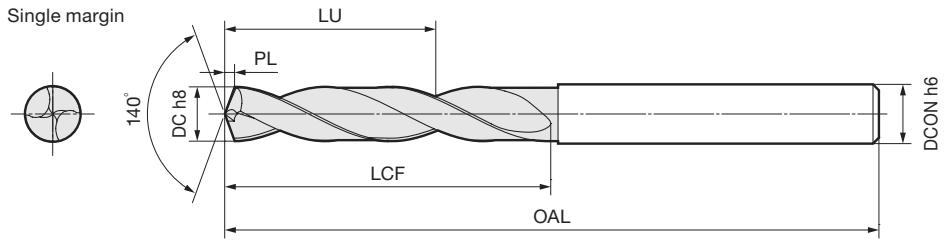
Grade ACT100

❍= Japan stock ● = Euro stock

MDE-E Type for Hub Drilling (External Coolant Supply)

Carbon Steel, Alloy Steel		Tempered Steel	Hardened Steel		Stainless Steel	Ti Alloy	Heat-resistant Steel	Cast Iron	Ductile Cast Iron	Aluminum Alloy	Copper Alloy	Composite CFRP
Up to 0.28%	From 0.29%		Up to 45HRC	From 46HRC								
○	◎	◎	○		○	○	○	◎	◎			

NX Coat 2D



Diameter: ø8.80 to 13.97 mm

Diameter DC (mm)	Hole Depth (L/D)	Stock	Cat. No.	Dimensions (mm)				
				Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON
8.80	2	❍	MDE 0880S09E02H	26.4	39.6	83.6	1.6	9.0
10.00	2	❍	MDE 1000S10E02H	27.8	42.8	88.8	1.8	10.0
10.80	2	❍	MDE 1080S11E02H	30.8	47.0	95.0	2.0	11.0
12.04	2	❍	MDE 1204S13E02H	31.1	49.2	102.2	2.2	13.0
12.52	2	❍	MDE 1252S13E02H	32.4	51.3	102.3	2.3	13.0
13.85	2	❍	MDE 1385S14E02H	33.7	54.5	107.5	2.5	14.0
13.92	2	❍	MDE 1392S14E02H	33.5	54.5	107.5	2.5	14.0
13.97	2	❍	MDE 1397S14E02H	33.5	54.5	107.5	2.5	14.0

Grade ACT100

❍= Japan stock ● = Euro stock

Recommended Cutting Conditions
(MDE-E Type, External Coolant Supply, 2D/4D) Includes Hub drilling

Work Material		Mild Steel/Low Carbon Steel SS400/S15C up to 160HB		Carbon Steel S35C/S50C up to 230HB		Alloy Steel SCM/SCr 20 to 30HRC		Alloy Steel SCM/SCr 30 to 38HRC	
Cutting speed	Dia. <ø3	30 to 80m/min		30 to 80m/min		30 to 80m/min		30 to 80m/min	
	Dia. ≥ø3	60 to 100m/min		60 to 120m/min		50 to 100m/min		40 to 80m/min	
Diameter DC		Spindle speed (min^{-1})	Feed rate (mm/rev)	Spindle speed (min^{-1})	Feed rate (mm/rev)	Spindle speed (min^{-1})	Feed rate (mm/rev)	Spindle speed (min^{-1})	Feed rate (mm/rev)
ø1.0		9,500	0.02 to 0.04	9,500	0.02 to 0.04	9,500	0.02 to 0.04	9,500	0.02 to 0.03
ø1.5		8,500	0.03 to 0.06	8,500	0.03 to 0.06	8,500	0.03 to 0.06	8,500	0.03 to 0.06
ø2.0		9,000	0.04 to 0.08	8,000	0.04 to 0.08	8,000	0.04 to 0.08	8,000	0.04 to 0.08
ø2.5		9,500	0.04 to 0.08	9,000	0.04 to 0.08	8,500	0.04 to 0.08	7,600	0.04 to 0.08
ø3.0		8,500	0.05 to 0.12	8,500	0.05 to 0.12	7,500	0.05 to 0.12	6,400	0.05 to 0.12
ø4.0		6,400	0.07 to 0.17	6,400	0.07 to 0.17	5,600	0.07 to 0.17	4,800	0.07 to 0.17
ø5.0		5,100	0.08 to 0.20	5,100	0.08 to 0.20	4,500	0.08 to 0.20	3,900	0.08 to 0.20
ø6.0		4,300	0.10 to 0.20	4,300	0.10 to 0.20	3,800	0.10 to 0.20	3,200	0.10 to 0.20
ø7.0		3,700	0.12 to 0.23	3,700	0.12 to 0.23	3,200	0.12 to 0.23	2,800	0.12 to 0.23
ø8.0		3,200	0.15 to 0.25	3,200	0.15 to 0.25	2,800	0.15 to 0.25	2,400	0.15 to 0.25
ø9.0		2,900	0.17 to 0.25	2,900	0.17 to 0.25	2,500	0.17 to 0.25	2,200	0.17 to 0.25
ø10.0		2,600	0.18 to 0.28	2,600	0.18 to 0.28	2,300	0.18 to 0.28	2,000	0.18 to 0.28
ø11.0		2,400	0.20 to 0.30	2,400	0.20 to 0.30	2,100	0.20 to 0.30	1,800	0.20 to 0.30
ø12.0		2,200	0.20 to 0.30	2,200	0.20 to 0.30	1,900	0.20 to 0.30	1,600	0.20 to 0.30
ø14.0		1,900	0.20 to 0.30	1,900	0.20 to 0.30	1,600	0.20 to 0.30	1,400	0.20 to 0.30
ø16.0		1,600	0.20 to 0.30	1,600	0.20 to 0.30	1,400	0.20 to 0.30	1,200	0.20 to 0.30
ø18.0		1,500	0.20 to 0.30	1,500	0.20 to 0.30	1,300	0.20 to 0.30	1,100	0.20 to 0.30
ø20.0		1,300	0.20 to 0.30	1,300	0.20 to 0.30	1,200	0.20 to 0.30	1,000	0.20 to 0.30
High-efficiency Product		GS Type		GS Type		GS Type		GS Type	

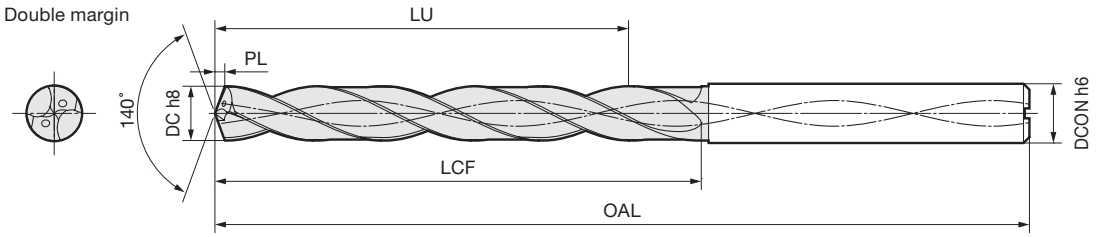
Work Material		Cast Iron FC250 to 280HB		Ductile Cast Iron FCD450/FCD600 to 270HB		Stainless Steel (oil-based drilling) SUS304/SUS410 to 200HB		Special Steel/Pre-hardened Steel SKS2/SKD61 (non-tempered) 30 to 38 HRC	
Cutting speed	Dia. <ø3	30 to 80m/min		30 to 80m/min		20 to 50m/min		30 to 60m/min	
	Dia. ≥ø3	60 to 100m/min		50 to 100m/min		20 to 50m/min		30 to 60m/min	
Diameter DC		Spindle speed (min^{-1})	Feed rate (mm/rev)	Spindle speed (min^{-1})	Feed rate (mm/rev)	Spindle speed (min^{-1})	Feed rate (mm/rev)	Spindle speed (min^{-1})	Feed rate (mm/rev)
ø1.0		9,500	0.02 to 0.04	9,500	0.02 to 0.04	9,500	0.02 to 0.03	9,500	0.02 to 0.03
ø1.5		8,500	0.03 to 0.06	8,500	0.03 to 0.06	8,500	0.02 to 0.05	8,500	0.02 to 0.04
ø2.0		8,000	0.04 to 0.08	8,000	0.04 to 0.08	6,300	0.03 to 0.06	7,100	0.03 to 0.06
ø2.5		9,000	0.04 to 0.08	8,500	0.04 to 0.08	5,100	0.03 to 0.07	5,700	0.03 to 0.06
ø3.0		8,500	0.06 to 0.15	7,500	0.05 to 0.12	4,300	0.05 to 0.10	5,400	0.05 to 0.12
ø4.0		6,400	0.08 to 0.18	5,600	0.07 to 0.17	3,200	0.05 to 0.10	4,000	0.07 to 0.17
ø5.0		5,100	0.10 to 0.20	4,500	0.08 to 0.20	2,600	0.06 to 0.15	3,200	0.08 to 0.20
ø6.0		4,300	0.12 to 0.23	3,800	0.10 to 0.20	2,200	0.06 to 0.15	2,700	0.10 to 0.20
ø7.0		3,700	0.12 to 0.23	3,200	0.12 to 0.23	1,900	0.06 to 0.18	2,300	0.10 to 0.20
ø8.0		3,200	0.18 to 0.25	2,800	0.15 to 0.25	1,600	0.06 to 0.20	2,000	0.12 to 0.25
ø9.0		2,900	0.17 to 0.25	2,500	0.17 to 0.25	1,500	0.08 to 0.20	1,800	0.12 to 0.25
ø10.0		2,600	0.18 to 0.28	2,300	0.18 to 0.28	1,300	0.08 to 0.20	1,600	0.12 to 0.25
ø11.0		2,400	0.20 to 0.30	2,100	0.20 to 0.30	1,200	0.08 to 0.20	1,500	0.15 to 0.30
ø12.0		2,200	0.20 to 0.30	1,900	0.20 to 0.30	1,100	0.10 to 0.25	1,400	0.15 to 0.30
ø14.0		1,900	0.20 to 0.30	1,600	0.20 to 0.30	1,000	0.10 to 0.25	1,200	0.15 to 0.30
ø16.0		1,600	0.20 to 0.30	1,400	0.20 to 0.30	800	0.10 to 0.25	1,000	0.15 to 0.30
ø18.0		1,500	0.20 to 0.30	1,300	0.20 to 0.30	800	0.10 to 0.25	900	0.15 to 0.30
ø20.0		1,300	0.20 to 0.30	1,200	0.20 to 0.30	700	0.10 to 0.25	800	0.15 to 0.30
High-efficiency Product		GS Type		GS Type		GS Type		GS Type	

1. The recommended cutting conditions below are for cases where a water soluble coolant is used (excluding drilling of stainless steel).
2. Supply sufficient water soluble coolant to the cutting edge.
3. If using non-water-soluble coolant, reduce the cutting speed by 20-30% and ensure that sufficient coolant is supplied.
4. When mounting the drill in the collet, make sure that runout around the cutting edge is no greater than 0.02mm.
5. Make sure the flute does not enter the collet.
6. If the surface of the workpiece is abnormally shaped (tilted, interrupted etc.), reduce the feed rate to about half when feeding the drill in the workpiece.
   * If stable drilling is still not possible, pre-machining of the flat surface with the MDF Flat MULTIDRILL is recommended.
7. When performing interrupted through drilling, reduce the feed rate to about half the feed rate used prior to this process.

MDE-H Type (Internal Coolant Supply)

Carbon Steel, Alloy Steel		Tempered Steel	Hardened Steel		Stainless Steel	Ti Alloy	Heat-resistant Steel	Cast Iron	Ductile Cast Iron	Aluminum Alloy	Copper Alloy	Composite CFRP
Up to 0.28%	From 0.29%		Up to 45HRC	From 46HRC								
◎	◎	◎	○		◎	○	○	◎	◎	○	○	

NX Coat | W/ Oil Hole | 3D | 5D | 8D



Diameter: ø1.0 to 2.4 mm

Diameter DC (mm)	Hole Depth (LD)	Stock	Cat. No.	Dimensions (mm)				
				Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON
1.0	3	•	MDE 0100S03H03	6.7	8.2	57.2	0.2	3.0
	5	•	MDE 0100S03H05	8.7	10.2	59.2	0.2	3.0
	8	❍	MDE 0100S03H08	11.7	13.2	62.2	0.2	3.0
1.1	3	•	MDE 0110S03H03	6.6	8.2	57.2	0.2	3.0
	5	•	MDE 0110S03H05	8.6	10.2	59.2	0.2	3.0
	8	❍	MDE 0110S03H08	12.6	14.2	62.2	0.2	3.0
1.2	3	•	MDE 0120S03H03	7.4	9.2	57.2	0.2	3.0
	5	•	MDE 0120S03H05	9.4	11.2	59.2	0.2	3.0
	8	❍	MDE 0120S03H08	13.4	15.2	62.2	0.2	3.0
1.3	3	•	MDE 0130S03H03	7.3	9.2	57.2	0.2	3.0
	5	•	MDE 0130S03H05	10.3	12.2	59.2	0.2	3.0
	8	❍	MDE 0130S03H08	14.3	16.2	62.2	0.2	3.0
1.4	3	•	MDE 0140S03H03	8.2	10.3	57.3	0.3	3.0
	5	•	MDE 0140S03H05	11.2	13.3	59.3	0.3	3.0
	8	❍	MDE 0140S03H08	15.2	17.3	62.3	0.3	3.0
1.5	3	•	MDE 0150S03H03	9.1	11.3	57.3	0.3	3.0
	5	•	MDE 0150S03H05	12.1	14.3	59.3	0.3	3.0
	8	❍	MDE 0150S03H08	16.1	18.3	62.3	0.3	3.0
1.6	3	•	MDE 0160S03H03	8.9	11.3	59.3	0.3	3.0
	5	•	MDE 0160S03H05	11.9	14.3	62.3	0.3	3.0
	8	❍	MDE 0160S03H08	16.9	19.3	67.3	0.3	3.0
1.7	3	•	MDE 0170S03H03	9.8	12.3	59.3	0.3	3.0
	5	•	MDE 0170S03H05	12.8	15.3	62.3	0.3	3.0
	8	❍	MDE 0170S03H08	17.8	20.3	67.3	0.3	3.0
1.8	3	•	MDE 0180S03H03	9.6	12.3	59.3	0.3	3.0
	5	•	MDE 0180S03H05	13.6	16.3	62.3	0.3	3.0
	8	❍	MDE 0180S03H08	18.6	21.3	67.3	0.3	3.0
1.9	3	•	MDE 0190S03H03	10.5	13.3	59.3	0.3	3.0
	5	•	MDE 0190S03H05	14.5	17.3	62.3	0.3	3.0
	8	❍	MDE 0190S03H08	19.5	22.3	70.3	0.3	3.0
2.0	3	•	MDE 0200S03H03	11.4	14.4	59.4	0.4	3.0
	5	•	MDE 0200S03H05	15.4	18.4	62.4	0.4	3.0
	8	❍	MDE 0200S03H08	21.4	24.4	70.4	0.4	3.0
2.1	3	•	MDE 0210S03H03	11.3	14.4	59.4	0.4	3.0
	5	•	MDE 0210S03H05	15.3	18.4	62.4	0.4	3.0
	8	❍	MDE 0210S03H08	22.3	25.4	70.4	0.4	3.0
2.2	3	•	MDE 0220S03H03	12.1	15.4	59.4	0.4	3.0
	5	•	MDE 0220S03H05	16.1	19.4	62.4	0.4	3.0
	8	❍	MDE 0220S03H08	23.1	26.4	70.4	0.4	3.0
2.3	3	•	MDE 0230S03H03	12.0	15.4	63.4	0.4	3.0
	5	•	MDE 0230S03H05	17.0	20.4	68.4	0.4	3.0
	8	❍	MDE 0230S03H08	24.0	27.4	75.4	0.4	3.0
2.4	3	•	MDE 0240S03H03	12.8	16.4	63.4	0.4	3.0
	5	•	MDE 0240S03H05	17.8	21.4	68.4	0.4	3.0
	8	❍	MDE 0240S03H08	24.8	28.4	75.4	0.4	3.0

Grade ACT100

Diameter: ø2.5 to 3.0 mm

Diameter DC (mm)	Hole Depth (LD)	Stock	Cat. No.	Dimensions (mm)				
				Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON
2.5	3	•	MDE 0250S03H03	13.8	17.5	63.5	0.5	3.0
	5	•	MDE 0250S03H05	18.8	22.5	68.5	0.5	3.0
	8	❍	MDE 0250S03H08	25.8	29.5	75.5	0.5	3.0
2.6	3	•	MDE 0260S03H03	13.6	17.5	63.5	0.5	3.0
	5	•	MDE 0260S03H05	18.6	22.5	68.5	0.5	3.0
	8	❍	MDE 0260S03H08	26.6	30.5	75.5	0.5	3.0
2.7	3	•	MDE 0270S03H03	14.5	18.5	68.5	0.5	3.0
	5	•	MDE 0270S03H05	19.5	23.5	78.5	0.5	3.0
	8	❍	MDE 0270S03H08	27.5	31.5	81.5	0.5	3.0
2.76	5	•	MDE0276S03H05	20.3	24.5	78.5	0.5	3.0
2.78	5	•	MDE0278S03H05	20.3	24.5	78.5	0.5	3.0
2.8	3	•	MDE 0280S03H03	14.3	18.5	68.5	0.5	3.0
	5	•	MDE 0280S03H05	20.3	24.5	78.5	0.5	3.0
	8	❍	MDE 0280S03H08	28.3	32.5	81.5	0.5	3.0
2.9	3	•	MDE 0290S03H03	15.2	19.5	68.5	0.5	3.0
	5	•	MDE 0290S03H05	21.2	25.5	78.5	0.5	3.0
	8	❍	MDE 0290S03H08	29.2	33.5	81.5	0.5	3.0
3.0	3	•	MDE 0300S03H03	14.0	18.5	68.5	0.5	3.0
	5	•	MDE 0300S03H05	24.0	28.5	78.5	0.5	3.0
	8	❍	MDE 0300S03H08	29.0	33.5	81.5	0.5	3.0

Grade ACT100

❍= Japan stock ● = Euro stock

Recommended Cutting Conditions
(MDE-H Type, Internal Coolant Supply, 3D/5D/8D)

Work Material		Mild Steel/Low Carbon Steel SS400/S15C up to 160HB		Carbon Steel S35C/S50C up to 230HB		Alloy Steel SCM/SCr 20 to 30HRC		Alloy Steel SCM/SCr 30 to 38HRC	
Cutting speed	Dia. <ø3	30 to 80m/min		30 to 80m/min		30 to 80m/min		30 to 80m/min	
	Dia. ≥ø3	60 to 100m/min		60 to 120m/min		50 to 100m/min		40 to 80m/min	
Diameter DC		Spindle speed (min^{-1})	Feed rate (mm/rev)	Spindle speed (min^{-1})	Feed rate (mm/rev)	Spindle speed (min^{-1})	Feed rate (mm/rev)	Spindle speed (min^{-1})	Feed rate (mm/rev)
ø1.0		9,500	0.02 to 0.04	9,500	0.02 to 0.04	9,500	0.02 to 0.04	9,500	0.02 to 0.03
ø1.5		8,500	0.03 to 0.06	8,500	0.03 to 0.06	8,500	0.03 to 0.06	8,500	0.03 to 0.06
ø2.0		9,000	0.04 to 0.08	8,000	0.04 to 0.08	8,000	0.04 to 0.08	8,000	0.04 to 0.08
ø2.5		9,500	0.04 to 0.08	9,000	0.04 to 0.08	8,500	0.04 to 0.08	7,600	0.04 to 0.08
ø3.0		9,600	0.05 to 0.12	8,500	0.05 to 0.12	7,500	0.05 to 0.12	6,400	0.05 to 0.12
High-efficiency Product		HGS Type		HGS Type		HGS Type		HGS Type	

Work Material		Cast Iron FC250 to 280HB		Ductile Cast Iron FCD450/FCD600 to 270HB		Stainless Steel (oil-based drilling) SUS304/SUS410 to 200HB		Special Steel/Pre-hardened Steel SKS2/SKD61 (non-tempered) 30 to 38 HRC	
Cutting speed	Dia. <ø3	30 to 80m/min		30 to 80m/min		20 to 50m/min		30 to 60m/min	
	Dia. ≥ø3	60 to 100m/min		50 to 100m/min		20 to 50m/min		30 to 60m/min	
Diameter DC		Spindle speed (min^{-1})	Feed rate (mm/rev)	Spindle speed (min^{-1})	Feed rate (mm/rev)	Spindle speed (min^{-1})	Feed rate (mm/rev)	Spindle speed (min^{-1})	Feed rate (mm/rev)
ø1.0		9,500	0.02 to 0.04	9,500	0.02 to 0.04	9,500	0.02 to 0.03	9,500	0.02 to 0.03
ø1.5		8,500	0.03 to 0.06	8,500	0.03 to 0.06	8,500	0.02 to 0.05	8,500	0.02 to 0.04
ø2.0		8,000	0.04 to 0.08	8,000	0.04 to 0.08	8,000	0.03 to 0.06	7,100	0.03 to 0.06
ø2.5		9,000	0.04 to 0.08	8,500	0.04 to 0.08	7,600	0.03 to 0.07	5,700	0.03 to 0.06
ø3.0		8,500	0.06 to 0.15	7,500	0.05 to 0.12	6,400	0.05 to 0.12	4,800	0.05 to 0.10
High-efficiency Product		HX Type (HY Type)		HX Type (HY Type)		MDM Type		HGS Type	

1. The recommended cutting conditions below are for cases where a water soluble coolant is used.
2. MQL coolant is also usable. Note that external mixing MQL equipment may not generate MQL with a shank diameter (DCON) of ø16mm or more.
3. When mounting the drill in the collet, make sure that runout around the cutting edge is no greater than 0.02mm.
4. Make sure the flute does not enter the collet.
5. If the surface of the workpiece is abnormally shaped (tilted, interrupted etc.), reduce the feed rate to about half when feeding the drill in the workpiece.
   * If stable drilling is still not possible, pre-machining of the flat surface with the MDF Flat MULTIDRILL is recommended.
6. When performing interrupted through drilling, reduce the feed rate to about half the feed rate used prior to this process.

M E M O

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