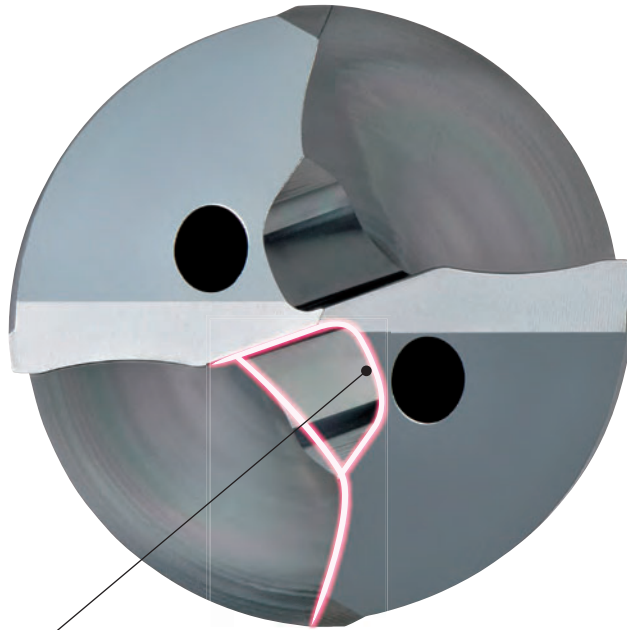


Coated Carbide Drills for Steel & Cast Iron

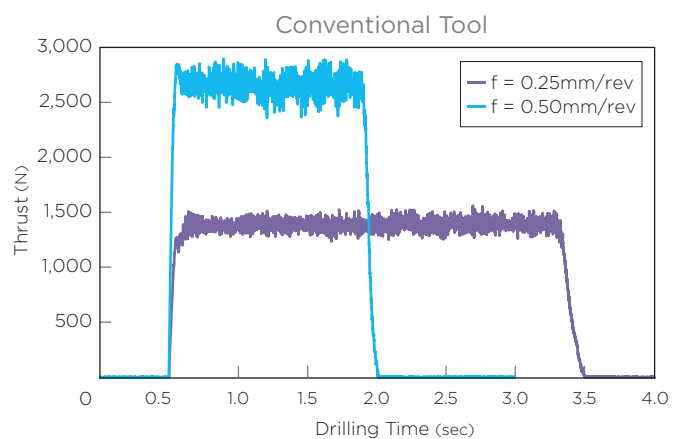
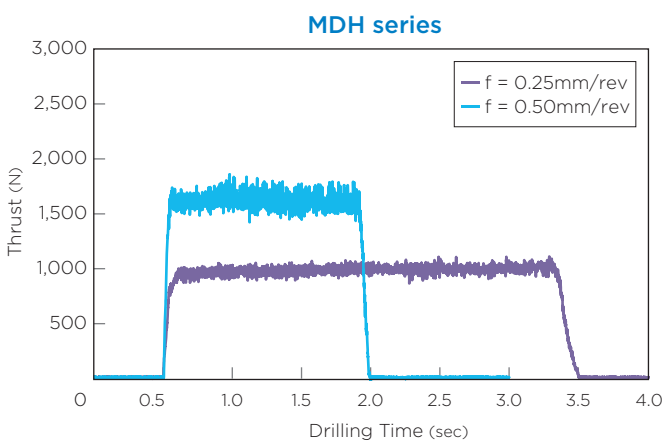
MULTIDRILL MDH series**Towards a new era of high-efficiency drilling****RP THINNING** with extremely low cutting resistance**HF Coat** realizing superb wear resistance and thermal resistance

Low cutting resistance stabilizes high-efficiency drilling



RP THINING

- Wide chip pocket enables smooth chip evacuation and reduced cutting, resistance ensuring stable drilling even in high-efficiency conditions

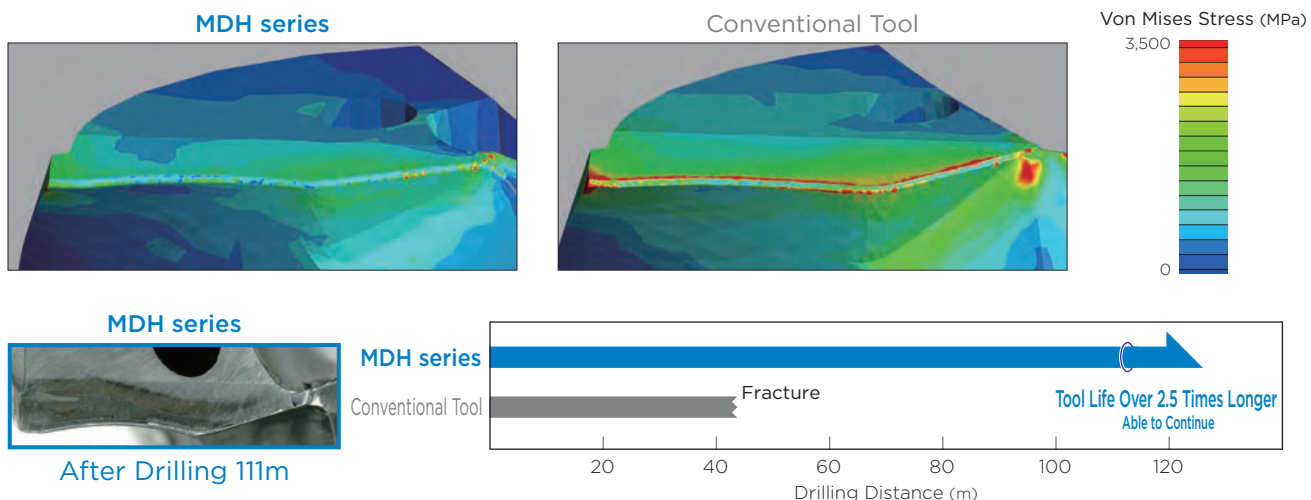


Work Material: S50C Tool: MDH 0800S08H05 Cutting Conditions: $v_c = 80\text{m/min}$ $H = 38\text{mm}$ (Through)
Wet (Water-soluble, Internal Coolant Supply)

Unlikely to fracture even in high-efficiency drilling

New Cutting Edge Shape

- Optimised cutting edge shape suppresses stress concentration and prevents chipping even in high-efficiency drilling with high cutting edge load



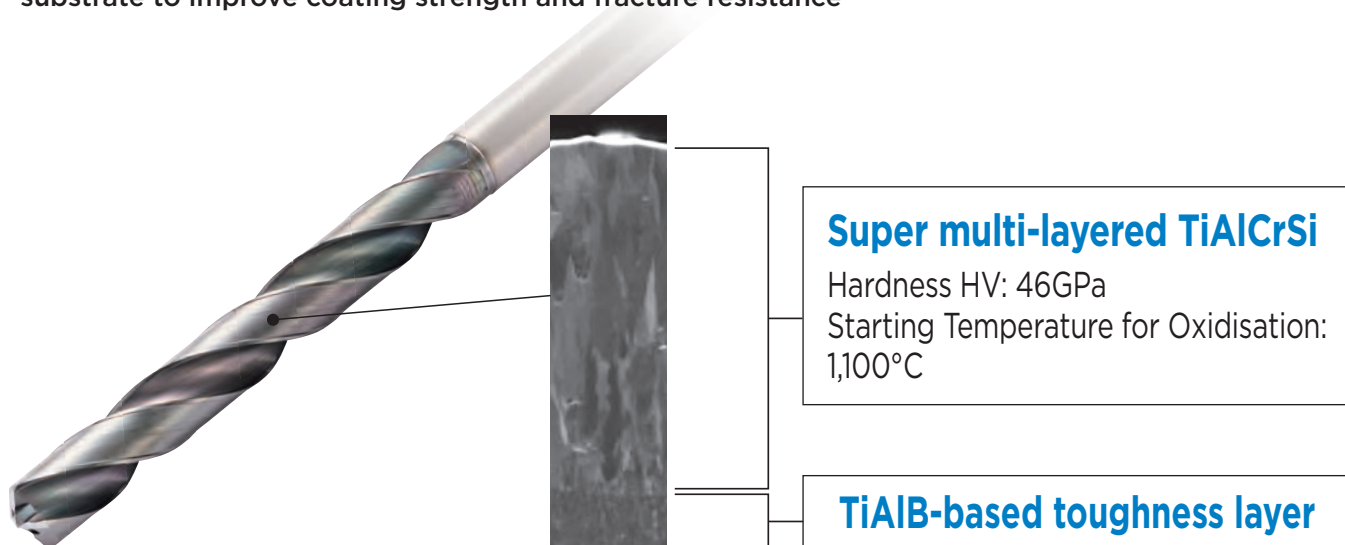
Work Material: S50C Tool: MDH 0800S08H05 Cutting Conditions: $v_c = 140\text{m/min}$ $f = 0.40\text{mm/rev}$ $H = 38\text{mm}$ (Through)
Wet (Water-soluble, Internal Coolant Supply)

New Grade ACH70

HF Coat

- TiAlCrSi-based super multi-layered coating realises excellent wear resistance and thermal resistance

Tough TiAlB-based coating is employed on the carbide substrate to improve coating strength and fracture resistance

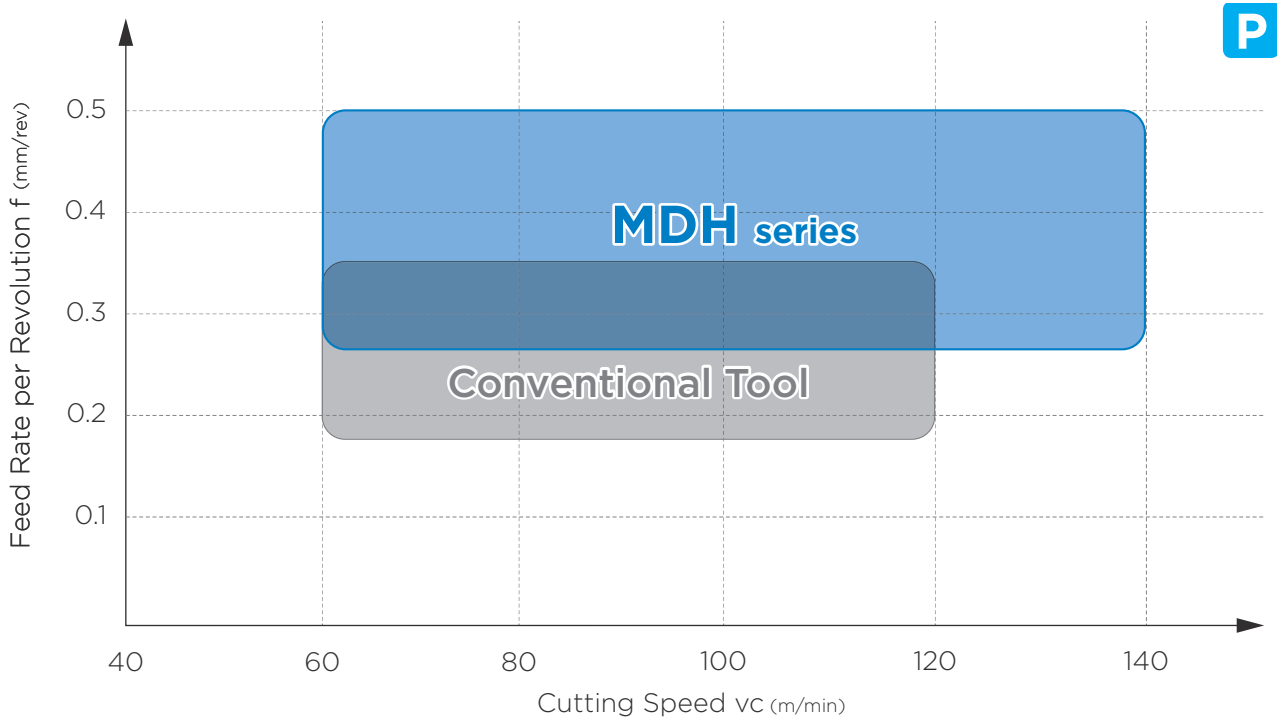


Balances wear and fracture resistance

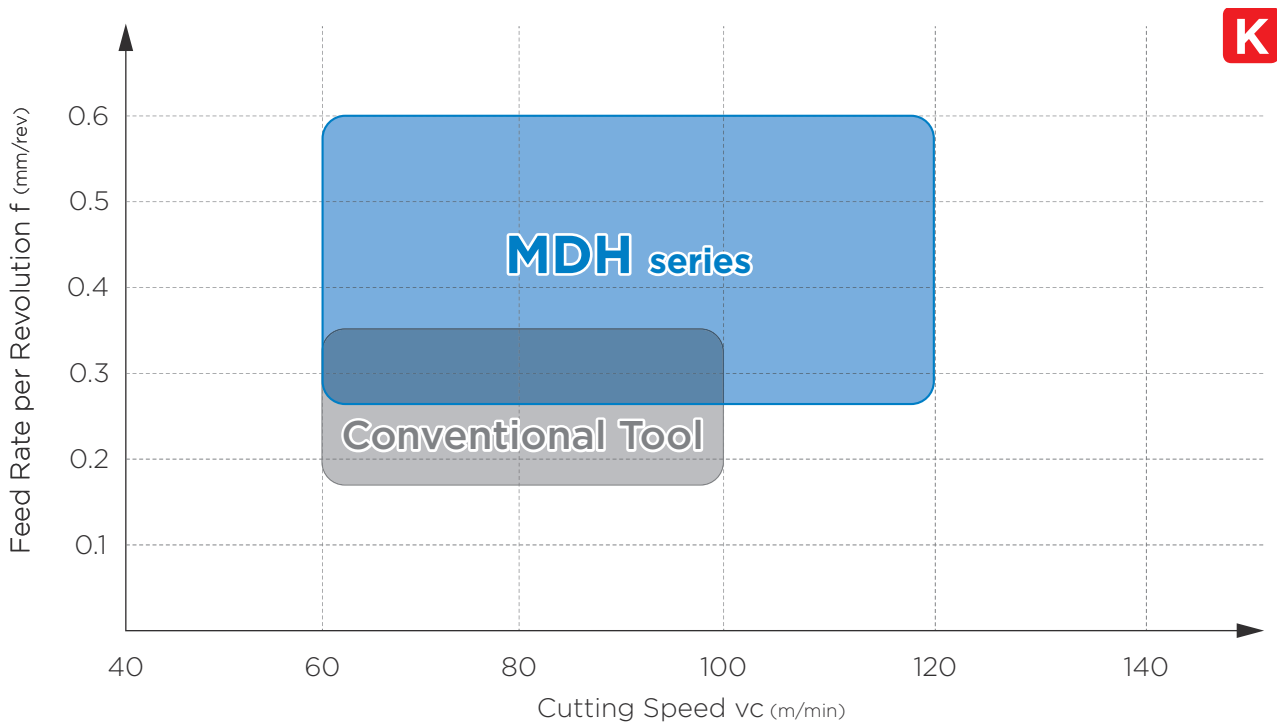
Realises unprecedented high-efficiency drilling

- High-efficiency drilling realises increased production capacity and yield

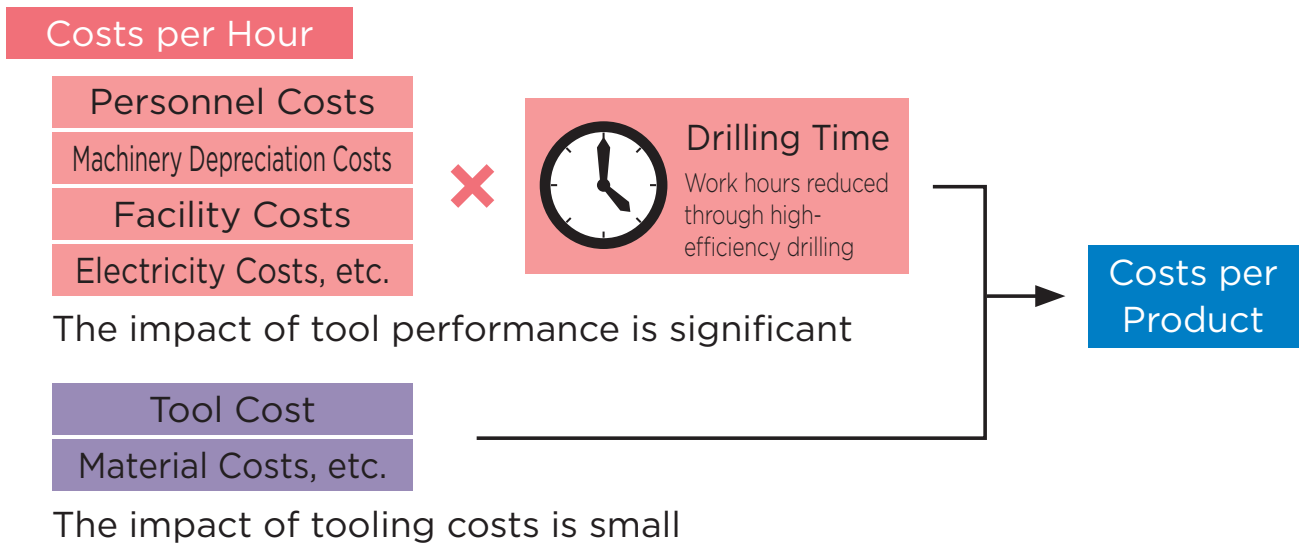
Efficiency Comparison in Steel Drilling (Diameter: $\varnothing 8\text{mm}$)



Efficiency Comparison in Cast Iron Drilling (Diameter: $\varnothing 8\text{mm}$)



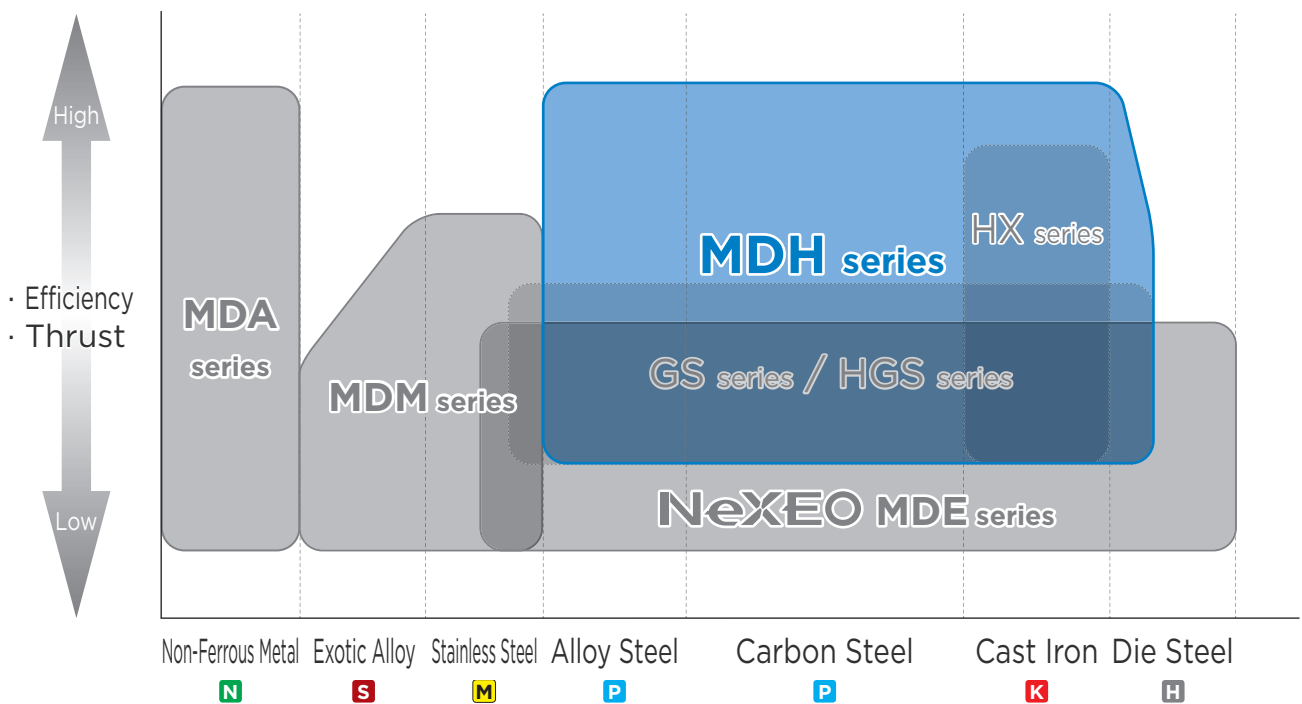
- **Contributes to reduced costs through high-efficiency drilling**



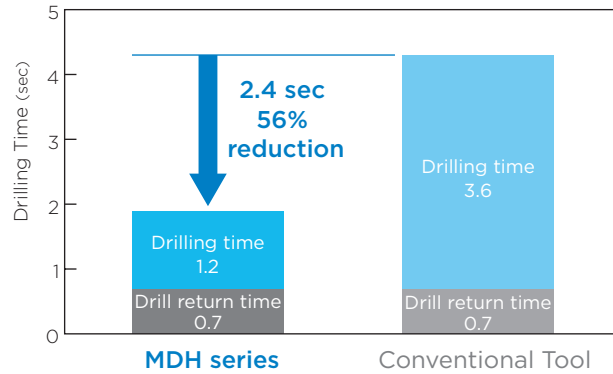
Reduced drilling time enables the reduction of personnel costs and other hourly costs

(Example of cost calculation)

- **Solid Carbide Drill Lineup by Work Material**



High-efficiency Drilling Performance 1 Reduced Cycle Time (Cylinder Component)



After Drilling 1,500 pcs



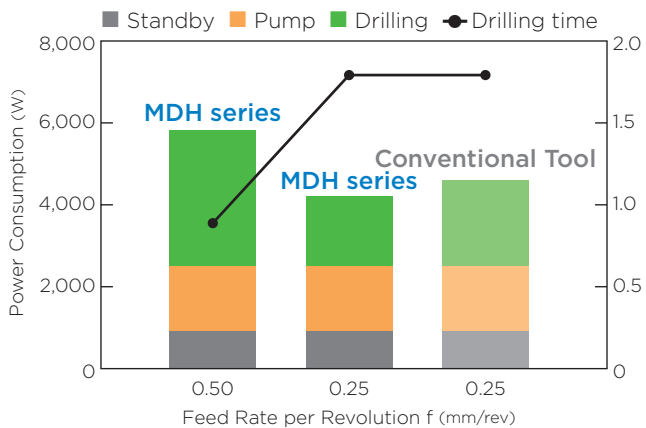
After Drilling 500 pcs

Work Material: SCM440H, Tool: MDH 0600S06H05
 Cutting Conditions: MDH series vc = 80m/min f = 0.35mm/rev H = 25mm (Blind) Wet (Water-soluble, Internal Coolant Supply)
 Conventional Tool vc = 51m/min f = 0.19mm/rev H = 25mm (Blind) Wet (Water-soluble, Internal Coolant Supply)

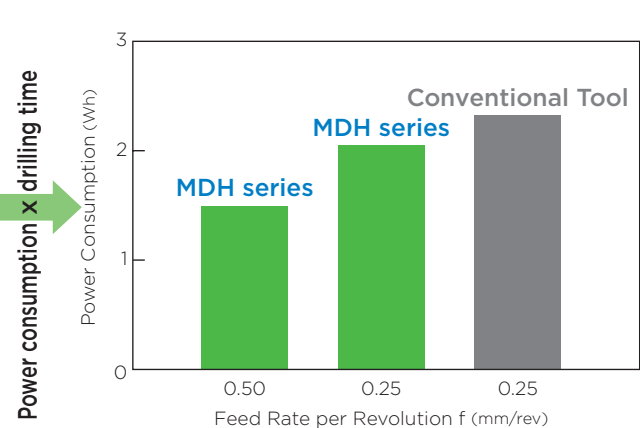
Approx. 3 times the drilling efficiency and 3 times longer tool life

High-efficiency Drilling Performance 2 Power Saving

Power Consumption and Drilling Time per Hole



Power Consumption per Hole



Work Material: S50C, Tool: MDH 0800S08H05 Cutting Conditions: vc = 80m/min H = 38mm (Through) Wet (Water-soluble, Internal Coolant Supply)

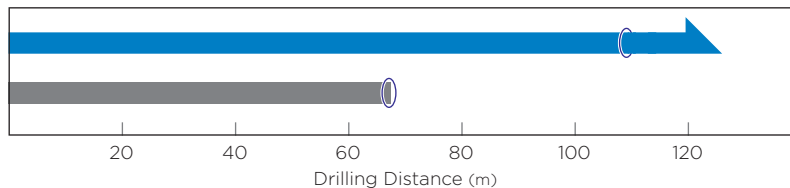
*Power consumption is based on calculations made at Sumitomo-owned facilities and may vary with operating environment.

High-efficiency drilling dramatically reduces drilling power consumption

High-efficiency Drilling Performance 3 Longer Tool Life

High-efficiency Cutting Conditions

Conventional Cutting Conditions

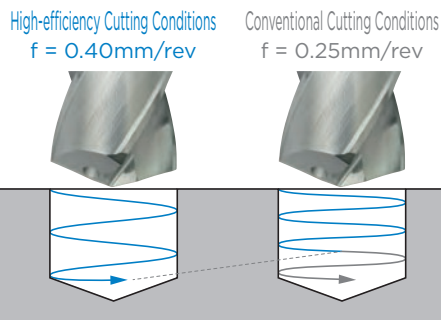


High-efficiency Cutting Conditions
After Drilling 111m



Conventional Cutting Conditions
After Drilling 67m

*Tool life varies based on the workpiece and operating environment.
The above does not guarantee that tool life will be extended.



Reduced peripheral abrasion distance suppresses wear

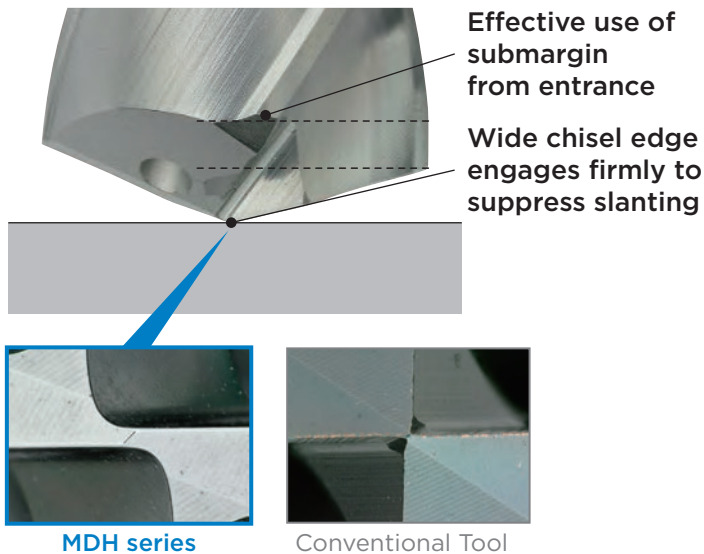
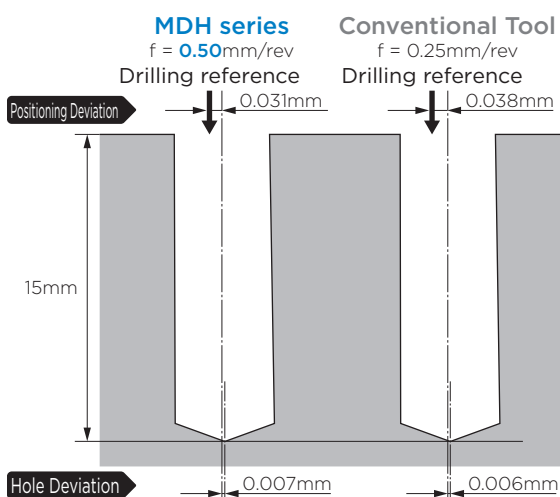
Work Material: S50C, Tool: MDH 0800S08H05

High-efficiency Cutting Conditions: $vc = 140\text{m/min}$ $f = 0.40\text{mm/rev}$ $H = 38\text{mm}$ (Through) Wet (Water-soluble, Internal Coolant Supply)

Conventional Cutting Conditions: $vc = 80\text{m/min}$ $f = 0.25\text{mm/rev}$ $H = 38\text{mm}$ (Through) Wet (Water-soluble, Internal Coolant Supply)

2.8 times the drilling efficiency and 1.3 times longer tool life

High-efficiency Drilling Performance 4 Hole Accuracy Comparison



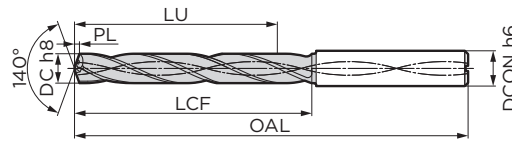
Work Material: S50C, Tool: MDH 0800S08H05

Cutting Conditions: $vc = 100\text{m/min}$ Wet (Water-soluble, Internal Coolant Supply)

Hole position precision and deviation equivalent to conventional cutting conditions, even at twice the drilling efficiency

For fitting tolerances, refer to the General Catalogue [Chapter N References].

Fig 1



■ Diameter ø3.0 to 4.3mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
3.0	3	●	MDH 0300S04H03	16.1	20.6	72.6	0.6	4.0	1
3.0	5	●	0300S04H05	28.1	32.6	86.6	0.6	4.0	1
3.0	8	●	0300S04H08	31.1	35.6	92.6	0.6	4.0	1
3.1	3	●	MDH 0310S04H03	16.0	20.6	72.6	0.6	4.0	1
3.1	5	●	0310S04H05	28.0	32.6	86.6	0.6	4.0	1
3.1	8	●	0310S04H08	31.0	35.6	92.6	0.6	4.0	1
3.2	3	●	MDH 0320S04H03	15.8	20.6	72.6	0.6	4.0	1
3.2	5	●	0320S04H05	27.8	32.6	86.6	0.6	4.0	1
3.2	8	●	0320S04H08	30.8	35.6	92.6	0.6	4.0	1
3.3	3	●	MDH 0330S04H03	15.7	20.6	72.6	0.6	4.0	1
3.3	5	●	0330S04H05	27.7	32.6	86.6	0.6	4.0	1
3.3	8	●	0330S04H08	30.7	35.6	92.6	0.6	4.0	1
3.4	3	●	MDH 0340S04H03	15.5	20.6	72.6	0.6	4.0	1
3.4	5	●	0340S04H05	27.5	32.6	86.6	0.6	4.0	1
3.4	8	●	0340S04H08	30.5	35.6	92.6	0.6	4.0	1
3.5	3	●	MDH 0350S04H03	15.4	20.6	72.6	0.6	4.0	1
3.5	5	●	0350S04H05	27.4	32.6	86.6	0.6	4.0	1
3.5	8	●	0350S04H08	30.4	35.6	92.6	0.6	4.0	1
3.6	3	●	MDH 0360S04H03	17.8	23.2	72.7	0.7	4.0	1
3.6	5	●	0360S04H05	31.3	36.7	86.7	0.7	4.0	1
3.6	8	●	0360S04H08	37.3	42.7	92.7	0.7	4.0	1
3.7	3	●	MDH 0370S04H03	17.7	23.2	72.7	0.7	4.0	1
3.7	5	●	0370S04H05	31.2	36.7	86.7	0.7	4.0	1
3.7	8	●	0370S04H08	37.2	42.7	92.7	0.7	4.0	1
3.8	3	●	MDH 0380S04H03	17.5	23.2	72.7	0.7	4.0	1
3.8	5	●	0380S04H05	31.0	36.7	86.7	0.7	4.0	1
3.8	8	●	0380S04H08	37.0	42.7	92.7	0.7	4.0	1
3.9	3	●	MDH 0390S04H03	17.4	23.2	72.7	0.7	4.0	1
3.9	5	●	0390S04H05	30.9	36.7	86.7	0.7	4.0	1
3.9	8	●	0390S04H08	36.9	42.7	92.7	0.7	4.0	1
4.0	3	●	MDH 0400S04H03	17.2	23.2	72.7	0.7	4.0	1
4.0	5	●	0400S04H05	30.7	36.7	86.7	0.7	4.0	1
4.0	8	●	0400S04H08	36.7	42.7	92.7	0.7	4.0	1
4.1	3	●	MDH 0410S06H03	19.7	25.8	80.8	0.8	6.0	1
4.1	5	●	0410S06H05	34.7	40.8	98.8	0.8	6.0	1
4.1	8	●	0410S06H08	41.7	47.8	105.8	0.8	6.0	1
4.2	3	●	MDH 0420S06H03	19.5	25.8	80.8	0.8	6.0	1
4.2	5	●	0420S06H05	34.5	40.8	98.8	0.8	6.0	1
4.2	8	●	0420S06H08	41.5	47.8	105.8	0.8	6.0	1
4.3	3	●	MDH 0430S06H03	19.4	25.8	80.8	0.8	6.0	1
4.3	5	●	0430S06H05	34.4	40.8	98.8	0.8	6.0	1
4.3	8	●	0430S06H08	41.4	47.8	105.8	0.8	6.0	1

Grade: ACH70

■ Diameter ø4.4 to 5.7mm

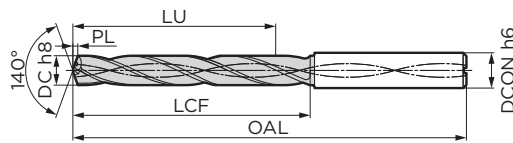
Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
4.4	3	●	MDH 0440S06H03	19.2	25.8	80.8	0.8	6.0	1
4.4	5	●	0440S06H05	34.2	40.8	98.8	0.8	6.0	1
4.4	8	●	0440S06H08	41.2	47.8	105.8	0.8	6.0	1
4.5	3	●	MDH 0450S06H03	19.1	25.8	80.8	0.8	6.0	1
4.5	5	●	0450S06H05	34.1	40.8	98.8	0.8	6.0	1
4.5	8	●	0450S06H08	41.1	47.8	105.8	0.8	6.0	1
4.6	3	●	MDH 0460S06H03	21.0	27.9	80.9	0.9	6.0	1
4.6	5	●	0460S06H05	38.0	44.9	98.9	0.9	6.0	1
4.6	8	●	0460S06H08	46.0	52.9	105.9	0.9	6.0	1
4.7	3	●	MDH 0470S06H03	20.9	27.9	80.9	0.9	6.0	1
4.7	5	●	0470S06H05	37.9	44.9	98.9	0.9	6.0	1
4.7	8	●	0470S06H08	45.9	52.9	105.9	0.9	6.0	1
4.8	3	●	MDH 0480S06H03	20.7	27.9	80.9	0.9	6.0	1
4.8	5	●	0480S06H05	37.7	44.9	98.9	0.9	6.0	1
4.8	8	●	0480S06H08	45.7	52.9	105.9	0.9	6.0	1
4.9	3	●	MDH 0490S06H03	20.6	27.9	80.9	0.9	6.0	1
4.9	5	●	0490S06H05	37.6	44.9	98.9	0.9	6.0	1
4.9	8	●	0490S06H08	45.6	52.9	105.9	0.9	6.0	1
5.0	3	●	MDH 0500S06H03	20.4	27.9	80.9	0.9	6.0	1
5.0	5	●	0500S06H05	37.4	44.9	98.9	0.9	6.0	1
5.0	8	●	0500S06H08	45.4	52.9	105.9	0.9	6.0	1
5.1	3	●	MDH 0510S06H03	20.9	28.5	83.0	1.0	6.0	1
5.1	5	●	0510S06H05	37.4	45.0	101.0	1.0	6.0	1
5.1	8	●	0510S06H08	52.4	60.0	119.0	1.0	6.0	1
5.2	3	●	MDH 0520S06H03	20.7	28.5	83.0	1.0	6.0	1
5.2	5	●	0520S06H05	37.2	45.0	101.0	1.0	6.0	1
5.2	8	●	0520S06H08	52.2	60.0	119.0	1.0	6.0	1
5.3	3	●	MDH 0530S06H03	20.6	28.5	83.0	1.0	6.0	1
5.3	5	●	0530S06H05	37.1	45.0	101.0	1.0	6.0	1
5.3	8	●	0530S06H08	52.1	60.0	119.0	1.0	6.0	1
5.4	3	●	MDH 0540S06H03	20.4	28.5	83.0	1.0	6.0	1
5.4	5	●	0540S06H05	36.9	45.0	101.0	1.0	6.0	1
5.4	8	●	0540S06H08	51.9	60.0	119.0	1.0	6.0	1
5.5	3	●	MDH 0550S06H03	20.3	28.5	83.0	1.0	6.0	1
5.5	5	●	0550S06H05	36.8	45.0	101.0	1.0	6.0	1
5.5	8	●	0550S06H08	51.8	60.0	119.0	1.0	6.0	1
5.6	3	●	MDH 0560S06H03	22.7	31.1	83.1	1.1	6.0	1
5.6	5	●	0560S06H05	40.7	49.1	101.1	1.1	6.0	1
5.6	8	●	0560S06H08	58.7	67.1	119.1	1.1	6.0	1
5.7	3	●	MDH 0570S06H03	22.6	31.1	83.1	1.1	6.0	1
5.7	5	●	0570S06H05	40.6	49.1	101.1	1.1	6.0	1
5.7	8	●	0570S06H08	58.6	67.1	119.1	1.1	6.0	1

Grade: ACH70

For fitting tolerances, refer to the General Catalogue [Chapter N References].

Fig 1



■ Diameter $\varnothing 5.8$ to 7.1mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
5.8	3	●	MDH 0580S06H03	22.4	31.1	83.1	1.1	6.0	1
5.8	5	●	0580S06H05	40.4	49.1	101.1	1.1	6.0	1
5.8	8	●	0580S06H08	58.4	67.1	119.1	1.1	6.0	1
5.9	3	●	MDH 0590S06H03	22.3	31.1	83.1	1.1	6.0	1
5.9	5	●	0590S06H05	40.3	49.1	101.1	1.1	6.0	1
5.9	8	●	0590S06H08	58.3	67.1	119.1	1.1	6.0	1
6.0	3	●	MDH 0600S06H03	22.1	31.1	83.1	1.1	6.0	1
6.0	5	●	0600S06H05	40.1	49.1	101.1	1.1	6.0	1
6.0	8	●	0600S06H08	58.1	67.1	119.1	1.1	6.0	1
6.1	3	●	MDH 0610S08H03	24.6	33.7	89.2	1.2	8.0	1
6.1	5	●	0610S08H05	44.1	53.2	110.2	1.2	8.0	1
6.1	8	●	0610S08H08	62.1	71.2	131.2	1.2	8.0	1
6.2	3	●	MDH 0620S08H03	24.4	33.7	89.2	1.2	8.0	1
6.2	5	●	0620S08H05	43.9	53.2	110.2	1.2	8.0	1
6.2	8	●	0620S08H08	61.9	71.2	131.2	1.2	8.0	1
6.3	3	●	MDH 0630S08H03	24.3	33.7	89.2	1.2	8.0	1
6.3	5	●	0630S08H05	43.8	53.2	110.2	1.2	8.0	1
6.3	8	●	0630S08H08	61.8	71.2	131.2	1.2	8.0	1
6.4	3	●	MDH 0640S08H03	24.1	33.7	89.2	1.2	8.0	1
6.4	5	●	0640S08H05	43.6	53.2	110.2	1.2	8.0	1
6.4	8	●	0640S08H08	61.6	71.2	131.2	1.2	8.0	1
6.5	3	●	MDH 0650S08H03	24.0	33.7	89.2	1.2	8.0	1
6.5	5	●	0650S08H05	43.5	53.2	110.2	1.2	8.0	1
6.5	8	●	0650S08H08	61.5	71.2	131.2	1.2	8.0	1
6.6	3	●	MDH 0660S08H03	24.4	34.3	89.3	1.3	8.0	1
6.6	5	●	0660S08H05	45.4	55.3	110.3	1.3	8.0	1
6.6	8	●	0660S08H08	66.4	76.3	131.3	1.3	8.0	1
6.7	3	●	MDH 0670S08H03	24.3	34.3	89.3	1.3	8.0	1
6.7	5	●	0670S08H05	45.3	55.3	110.3	1.3	8.0	1
6.7	8	●	0670S08H08	66.3	76.3	131.3	1.3	8.0	1
6.8	3	●	MDH 0680S08H03	24.1	34.3	89.3	1.3	8.0	1
6.8	5	●	0680S08H05	45.1	55.3	110.3	1.3	8.0	1
6.8	8	●	0680S08H08	66.1	76.3	131.3	1.3	8.0	1
6.9	3	●	MDH 0690S08H03	24.0	34.3	89.3	1.3	8.0	1
6.9	5	●	0690S08H05	45.0	55.3	110.3	1.3	8.0	1
6.9	8	●	0690S08H08	66.0	76.3	131.3	1.3	8.0	1
7.0	3	●	MDH 0700S08H03	23.8	34.3	89.3	1.3	8.0	1
7.0	5	●	0700S08H05	44.8	55.3	110.3	1.3	8.0	1
7.0	8	●	0700S08H08	65.8	76.3	131.3	1.3	8.0	1
7.1	3	●	MDH 0710S08H03	28.3	38.9	95.4	1.4	8.0	1
7.1	5	●	0710S08H05	50.8	61.4	119.4	1.4	8.0	1
7.1	8	●	0710S08H08	71.8	82.4	143.4	1.4	8.0	1

Grade: ACH70

■ Diameter $\varnothing 7.2$ to 8.5mm

Dimensions (mm)

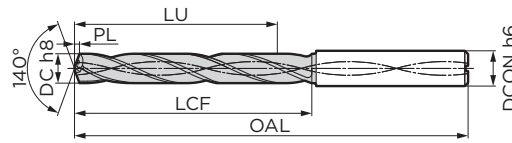
Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
7.2	3	●	MDH 0720S08H03	28.1	38.9	95.4	1.4	8.0	1
7.2	5	●	0720S08H05	50.6	61.4	119.4	1.4	8.0	1
7.2	8	●	0720S08H08	71.6	82.4	143.4	1.4	8.0	1
7.3	3	●	MDH 0730S08H03	28.0	38.9	95.4	1.4	8.0	1
7.3	5	●	0730S08H05	50.5	61.4	119.4	1.4	8.0	1
7.3	8	●	0730S08H08	71.5	82.4	143.4	1.4	8.0	1
7.4	3	●	MDH 0740S08H03	27.8	38.9	95.4	1.4	8.0	1
7.4	5	●	0740S08H05	50.3	61.4	119.4	1.4	8.0	1
7.4	8	●	0740S08H08	71.3	82.4	143.4	1.4	8.0	1
7.5	3	●	MDH 0750S08H03	27.7	38.9	95.4	1.4	8.0	1
7.5	5	●	0750S08H05	50.2	61.4	119.4	1.4	8.0	1
7.5	8	●	0750S08H08	71.2	82.4	143.4	1.4	8.0	1
7.6	3	●	MDH 0760S08H03	30.1	41.5	95.5	1.5	8.0	1
7.6	5	●	0760S08H05	54.1	65.5	119.5	1.5	8.0	1
7.6	8	●	0760S08H08	78.1	89.5	143.5	1.5	8.0	1
7.7	3	●	MDH 0770S08H03	30.0	41.5	95.5	1.5	8.0	1
7.7	5	●	0770S08H05	54.0	65.5	119.5	1.5	8.0	1
7.7	8	●	0770S08H08	78.0	89.5	143.5	1.5	8.0	1
7.8	3	●	MDH 0780S08H03	29.8	41.5	95.5	1.5	8.0	1
7.8	5	●	0780S08H05	53.8	65.5	119.5	1.5	8.0	1
7.8	8	●	0780S08H08	77.8	89.5	143.5	1.5	8.0	1
7.9	3	●	MDH 0790S08H03	29.7	41.5	95.5	1.5	8.0	1
7.9	5	●	0790S08H05	53.7	65.5	119.5	1.5	8.0	1
7.9	8	●	0790S08H08	77.7	89.5	143.5	1.5	8.0	1
8.0	3	●	MDH 0800S08H03	29.5	41.5	95.5	1.5	8.0	1
8.0	5	●	0800S08H05	53.5	65.5	119.5	1.5	8.0	1
8.0	8	●	0800S08H08	77.5	89.5	143.5	1.5	8.0	1
8.1	3	●	MDH 0810S10H03	31.9	44.0	101.5	1.5	10.0	1
8.1	5	●	0810S10H05	57.4	69.5	128.5	1.5	10.0	1
8.1	8	●	0810S10H08	81.4	93.5	155.5	1.5	10.0	1
8.2	3	●	MDH 0820S10H03	31.7	44.0	101.5	1.5	10.0	1
8.2	5	●	0820S10H05	57.2	69.5	128.5	1.5	10.0	1
8.2	8	●	0820S10H08	81.2	93.5	155.5	1.5	10.0	1
8.3	3	●	MDH 0830S10H03	31.6	44.0	101.5	1.5	10.0	1
8.3	5	●	0830S10H05	57.1	69.5	128.5	1.5	10.0	1
8.3	8	●	0830S10H08	81.1	93.5	155.5	1.5	10.0	1
8.4	3	●	MDH 0840S10H03	31.4	44.0	101.5	1.5	10.0	1
8.4	5	●	0840S10H05	56.9	69.5	128.5	1.5	10.0	1
8.4	8	●	0840S10H08	80.9	93.5	155.5	1.5	10.0	1
8.5	3	●	MDH 0850S10H03	31.3	44.0	101.5	1.5	10.0	1
8.5	5	●	0850S10H05	56.8	69.5	128.5	1.5	10.0	1
8.5	8	●	0850S10H08	80.8	93.5	155.5	1.5	10.0	1

Grade: ACH70

● mark: Standard stocked item

For fitting tolerances, refer to the General Catalogue [Chapter N References].

Fig 1



■ Diameter ø8.6 to 9.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
8.6	3	●	MDH 0860S10H03	31.7	44.6	101.6	1.6	10.0	1
8.6	5	●	0860S10H05	58.7	71.6	128.6	1.6	10.0	1
8.6	8	●	0860S10H08	85.7	98.6	155.6	1.6	10.0	1
8.7	3	●	MDH 0870S10H03	31.6	44.6	101.6	1.6	10.0	1
8.7	5	●	0870S10H05	58.6	71.6	128.6	1.6	10.0	1
8.7	8	●	0870S10H08	85.6	98.6	155.6	1.6	10.0	1
8.8	3	●	MDH 0880S10H03	31.4	44.6	101.6	1.6	10.0	1
8.8	5	●	0880S10H05	58.4	71.6	128.6	1.6	10.0	1
8.8	8	●	0880S10H08	85.4	98.6	155.6	1.6	10.0	1
8.9	3	●	MDH 0890S10H03	31.3	44.6	101.6	1.6	10.0	1
8.9	5	●	0890S10H05	58.3	71.6	128.6	1.6	10.0	1
8.9	8	●	0890S10H08	85.3	98.6	155.6	1.6	10.0	1
9.0	3	●	MDH 0900S10H03	31.1	44.6	101.6	1.6	10.0	1
9.0	5	●	0900S10H05	58.1	71.6	128.6	1.6	10.0	1
9.0	8	●	0900S10H08	85.1	98.6	155.6	1.6	10.0	1
9.1	3	●	MDH 0910S10H03	35.6	49.2	107.7	1.7	10.0	1
9.1	5	●	0910S10H05	64.1	77.7	137.7	1.7	10.0	1
9.1	8	●	0910S10H08	91.1	104.7	167.7	1.7	10.0	1
9.2	3	●	MDH 0920S10H03	35.4	49.2	107.7	1.7	10.0	1
9.2	5	●	0920S10H05	63.9	77.7	137.7	1.7	10.0	1
9.2	8	●	0920S10H08	90.9	104.7	167.7	1.7	10.0	1
9.3	3	●	MDH 0930S10H03	35.3	49.2	107.7	1.7	10.0	1
9.3	5	●	0930S10H05	63.8	77.7	137.7	1.7	10.0	1
9.3	8	●	0930S10H08	90.8	104.7	167.7	1.7	10.0	1
9.4	3	●	MDH 0940S10H03	35.1	49.2	107.7	1.7	10.0	1
9.4	5	●	0940S10H05	63.6	77.7	137.7	1.7	10.0	1
9.4	8	●	0940S10H08	90.6	104.7	167.7	1.7	10.0	1
9.5	3	●	MDH 0950S10H03	35.0	49.2	107.7	1.7	10.0	1
9.5	5	●	0950S10H05	63.5	77.7	137.7	1.7	10.0	1
9.5	8	●	0950S10H08	90.5	104.7	167.7	1.7	10.0	1
9.6	3	●	MDH 0960S10H03	37.4	51.8	107.8	1.8	10.0	1
9.6	5	●	0960S10H05	67.4	81.8	137.8	1.8	10.0	1
9.6	8	●	0960S10H08	97.4	111.8	167.8	1.8	10.0	1
9.7	3	●	MDH 0970S10H03	37.3	51.8	107.8	1.8	10.0	1
9.7	5	●	0970S10H05	67.3	81.8	137.8	1.8	10.0	1
9.7	8	●	0970S10H08	97.3	111.8	167.8	1.8	10.0	1
9.8	3	●	MDH 0980S10H03	37.1	51.8	107.8	1.8	10.0	1
9.8	5	●	0980S10H05	67.1	81.8	137.8	1.8	10.0	1
9.8	8	●	0980S10H08	97.1	111.8	167.8	1.8	10.0	1
9.9	3	●	MDH 0990S10H03	37.0	51.8	107.8	1.8	10.0	1
9.9	5	●	0990S10H05	67.0	81.8	137.8	1.8	10.0	1
9.9	8	●	0990S10H08	97.0	111.8	167.8	1.8	10.0	1

Grade: ACH70

■ Diameter ø10.0 to 11.3mm

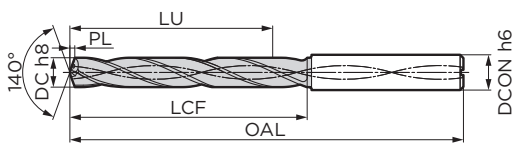
Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
10.0	3	●	MDH 1000S10H03	36.8	51.8	107.8	1.8	10.0	1
10.0	5	●	1000S10H05	66.8	81.8	137.8	1.8	10.0	1
10.0	8	●	1000S10H08	96.8	111.8	167.8	1.8	10.0	1
10.1	3	●	MDH 1010S12H03	39.3	54.4	117.9	1.9	12.0	1
10.1	5	●	1010S12H05	70.8	85.9	150.9	1.9	12.0	1
10.1	8	●	1010S12H08	100.8	115.9	183.9	1.9	12.0	1
10.2	3	●	MDH 1020S12H03	39.1	54.4	117.9	1.9	12.0	1
10.2	5	●	1020S12H05	70.6	85.9	150.9	1.9	12.0	1
10.2	8	●	1020S12H08	100.6	115.9	183.9	1.9	12.0	1
10.3	3	●	MDH 1030S12H03	39.0	54.4	117.9	1.9	12.0	1
10.3	5	●	1030S12H05	70.5	85.9	150.9	1.9	12.0	1
10.3	8	●	1030S12H08	100.5	115.9	183.9	1.9	12.0	1
10.4	3	●	MDH 1040S12H03	38.8	54.4	117.9	1.9	12.0	1
10.4	5	●	1040S12H05	70.3	85.9	150.9	1.9	12.0	1
10.4	8	●	1040S12H08	100.3	115.9	183.9	1.9	12.0	1
10.5	3	●	MDH 1050S12H03	38.7	54.4	117.9	1.9	12.0	1
10.5	5	●	1050S12H05	70.2	85.9	150.9	1.9	12.0	1
10.5	8	●	1050S12H08	100.2	115.9	183.9	1.9	12.0	1
10.6	3	●	MDH 1060S12H03	39.1	55.0	118.0	2.0	12.0	1
10.6	5	●	1060S12H05	72.1	88.0	151.0	2.0	12.0	1
10.6	8	●	1060S12H08	105.1	121.0	184.0	2.0	12.0	1
10.7	3	●	MDH 1070S12H03	39.0	55.0	118.0	2.0	12.0	1
10.7	5	●	1070S12H05	72.0	88.0	151.0	2.0	12.0	1
10.7	8	●	1070S12H08	105.0	121.0	184.0	2.0	12.0	1
10.8	3	●	MDH 1080S12H03	38.8	55.0	118.0	2.0	12.0	1
10.8	5	●	1080S12H05	71.8	88.0	151.0	2.0	12.0	1
10.8	8	●	1080S12H08	104.8	121.0	184.0	2.0	12.0	1
10.9	3	●	MDH 1090S12H03	38.7	55.0	118.0	2.0	12.0	1
10.9	5	●	1090S12H05	71.7	88.0	151.0	2.0	12.0	1
10.9	8	●	1090S12H08	104.7	121.0	184.0	2.0	12.0	1
11.0	3	●	MDH 1100S12H03	38.5	55.0	118.0	2.0	12.0	1
11.0	5	●	1100S12H05	71.5	88.0	151.0	2.0	12.0	1
11.0	8	●	1100S12H08	104.5	121.0	184.0	2.0	12.0	1
11.1	3	●	MDH 1110S12H03	43.0	59.6	124.1	2.1	12.0	1
11.1	5	●	1110S12H05	77.5	94.1	160.1	2.1	12.0	1
11.1	8	●	1110S12H08	110.5	127.1	196.1	2.1	12.0	1
11.2	3	●	MDH 1120S12H03	42.8	59.6	124.1	2.1	12.0	1
11.2	5	●	1120S12H05	77.3	94.1	160.1	2.1	12.0	1
11.2	8	●	1120S12H08	110.3	127.1	196.1	2.1	12.0	1
11.3	3	●	MDH 1130S12H03	42.7	59.6	124.1	2.1	12.0	1
11.3	5	●	1130S12H05	77.2	94.1	160.1	2.1	12.0	1
11.3	8	●	1130S12H08	110.2	127.1	196.1	2.1	12.0	1

Grade: ACH70

For fitting tolerances, refer to the General Catalogue [Chapter N References].

Fig 1



■ Diameter ø11.4 to 12.7mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip Length PL	Shank Dia. DCON	Fig
11.4	3	●	MDH 1140S12H03	42.5	59.6	124.1	2.1	12.0	1
11.4	5	●	1140S12H05	77.0	94.1	160.1	2.1	12.0	1
11.4	8	●	1140S12H08	110.0	127.1	196.1	2.1	12.0	1
11.5	3	●	MDH 1150S12H03	42.4	59.6	124.1	2.1	12.0	1
11.5	5	●	1150S12H05	76.9	94.1	160.1	2.1	12.0	1
11.5	8	●	1150S12H08	109.9	127.1	196.1	2.1	12.0	1
11.6	3	●	MDH 1160S12H03	44.8	62.2	124.2	2.2	12.0	1
11.6	5	●	1160S12H05	80.8	98.2	160.2	2.2	12.0	1
11.6	8	●	1160S12H08	116.8	134.2	196.2	2.2	12.0	1
11.7	3	●	MDH 1170S12H03	44.7	62.2	124.2	2.2	12.0	1
11.7	5	●	1170S12H05	80.7	98.2	160.2	2.2	12.0	1
11.7	8	●	1170S12H08	116.7	134.2	196.2	2.2	12.0	1
11.8	3	●	MDH 1180S12H03	44.5	62.2	124.2	2.2	12.0	1
11.8	5	●	1180S12H05	80.5	98.2	160.2	2.2	12.0	1
11.8	8	●	1180S12H08	116.5	134.2	196.2	2.2	12.0	1
11.9	3	●	MDH 1190S12H03	44.4	62.2	124.2	2.2	12.0	1
11.9	5	●	1190S12H05	80.4	98.2	160.2	2.2	12.0	1
11.9	8	●	1190S12H08	116.4	134.2	196.2	2.2	12.0	1
12.0	3	●	MDH 1200S12H03	44.2	62.2	124.2	2.2	12.0	1
12.0	5	●	1200S12H05	80.2	98.2	160.2	2.2	12.0	1
12.0	8	●	1200S12H08	116.2	134.2	196.2	2.2	12.0	1
12.1	3	●	MDH 1210S14H03	46.7	64.8	130.3	2.3	14.0	1
12.1	5	●	1210S14H05	84.2	102.3	169.3	2.3	14.0	1
12.1	8	●	1210S14H08	120.2	138.3	208.3	2.3	14.0	1
12.2	3	●	MDH 1220S14H03	46.5	64.8	130.3	2.3	14.0	1
12.2	5	●	1220S14H05	84.0	102.3	169.3	2.3	14.0	1
12.2	8	●	1220S14H08	120.0	138.3	208.3	2.3	14.0	1
12.3	3	●	MDH 1230S14H03	46.4	64.8	130.3	2.3	14.0	1
12.3	5	●	1230S14H05	83.9	102.3	169.3	2.3	14.0	1
12.3	8	●	1230S14H08	119.9	138.3	208.3	2.3	14.0	1
12.4	3	●	MDH 1240S14H03	46.2	64.8	130.3	2.3	14.0	1
12.4	5	●	1240S14H05	83.7	102.3	169.3	2.3	14.0	1
12.4	8	●	1240S14H08	119.7	138.3	208.3	2.3	14.0	1
12.5	3	●	MDH 1250S14H03	46.1	64.8	130.3	2.3	14.0	1
12.5	5	●	1250S14H05	83.6	102.3	169.3	2.3	14.0	1
12.5	8	●	1250S14H08	119.6	138.3	208.3	2.3	14.0	1
12.6	3	●	MDH 1260S14H03	46.5	65.4	130.4	2.4	14.0	1
12.6	5	●	1260S14H05	85.5	104.4	169.4	2.4	14.0	1
12.6	8	●	1260S14H08	124.5	143.4	208.4	2.4	14.0	1
12.7	3	●	MDH 1270S14H03	46.4	65.4	130.4	2.4	14.0	1
12.7	5	●	1270S14H05	85.4	104.4	169.4	2.4	14.0	1
12.7	8	●	1270S14H08	124.4	143.4	208.4	2.4	14.0	1

Grade: ACH70

■ Diameter ø12.8 to 14.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip Length PL	Shank Dia. DCON	Fig
12.8	3	●	MDH 1280S14H03	46.2	65.4	130.4	2.4	14.0	1
12.8	5	●	1280S14H05	85.2	104.4	169.4	2.4	14.0	1
12.8	8	●	1280S14H08	124.2	143.4	208.4	2.4	14.0	1
12.9	3	●	MDH 1290S14H03	46.1	65.4	130.4	2.4	14.0	1
12.9	5	●	1290S14H05	85.1	104.4	169.4	2.4	14.0	1
12.9	8	●	1290S14H08	124.1	143.4	208.4	2.4	14.0	1
13.0	3	●	MDH 1300S14H03	45.9	65.4	130.4	2.4	14.0	1
13.0	5	●	1300S14H05	84.9	104.4	169.4	2.4	14.0	1
13.0	8	●	1300S14H08	123.9	143.4	208.4	2.4	14.0	1
13.1	3	●	MDH 1310S14H03	50.4	70.0	136.5	2.5	14.0	1
13.1	5	●	1310S14H05	90.9	110.5	178.5	2.5	14.0	1
13.1	8	●	1310S14H08	129.9	149.5	220.5	2.5	14.0	1
13.2	3	●	MDH 1320S14H03	50.2	70.0	136.5	2.5	14.0	1
13.2	5	●	1320S14H05	90.7	110.5	178.5	2.5	14.0	1
13.2	8	●	1320S14H08	129.7	149.5	220.5	2.5	14.0	1
13.3	3	●	MDH 1330S14H03	50.1	70.0	136.5	2.5	14.0	1
13.3	5	●	1330S14H05	90.6	110.5	178.5	2.5	14.0	1
13.3	8	●	1330S14H08	129.6	149.5	220.5	2.5	14.0	1
13.4	3	●	MDH 1340S14H03	49.9	70.0	136.5	2.5	14.0	1
13.4	5	●	1340S14H05	90.4	110.5	178.5	2.5	14.0	1
13.4	8	●	1340S14H08	129.4	149.5	220.5	2.5	14.0	1
13.5	3	●	MDH 1350S14H03	49.8	70.0	136.5	2.5	14.0	1
13.5	5	●	1350S14H05	90.3	110.5	178.5	2.5	14.0	1
13.5	8	●	1350S14H08	129.3	149.5	220.5	2.5	14.0	1
13.6	3	●	MDH 1360S14H03	52.1	72.5	136.5	2.5	14.0	1
13.6	5	●	1360S14H05	94.1	114.5	178.5	2.5	14.0	1
13.6	8	●	1360S14H08	136.1	156.5	220.5	2.5	14.0	1
13.7	3	●	MDH 1370S14H03	52.0	72.5	136.5	2.5	14.0	1
13.7	5	●	1370S14H05	94.0	114.5	178.5	2.5	14.0	1
13.7	8	●	1370S14H08	136.0	156.5	220.5	2.5	14.0	1
13.8	3	●	MDH 1380S14H03	51.8	72.5	136.5	2.5	14.0	1
13.8	5	●	1380S14H05	93.8	114.5	178.5	2.5	14.0	1
13.8	8	●	1380S14H08	135.8	156.5	220.5	2.5	14.0	1
13.9	3	●	MDH 1390S14H03	51.7	72.5	136.5	2.5	14.0	1
13.9	5	●	1390S14H05	93.7	114.5	178.5	2.5	14.0	1
13.9	8	●	1390S14H08	135.7	156.5	220.5	2.5	14.0	1
14.0	3	●	MDH 1400S14H03	51.5	72.5	136.5	2.5	14.0	1
14.0	5	●	1400S14H05	93.5	114.5	178.5	2.5	14.0	1
14.0	8	●	1400S14H08	135.5	156.5	220.5	2.5	14.0	1

Grade: ACH70

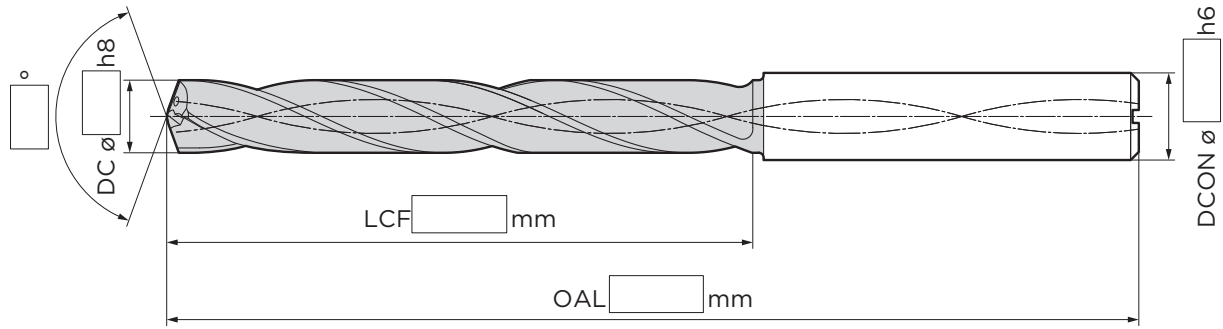
■ Recommended Cutting Conditions

Work Material	Mild Steel/Low Carbon Steel SS400/S15C - 160HB		Carbon Steel S35C/S50C - 230HB		Alloy Steel SCM/SCr 20 to 30HRC		Alloy Steel SCM/SCr 30 to 38HRC	
Cutting Speed	60 to 120m/min		60 to 140m/min		60 to 100m/min		60 to 100m/min	
Dia. (mm)	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)
3.0	8,500	0.12 to 0.30	10,610	0.12 to 0.30	8,500	0.12 to 0.30	8,500	0.12 to 0.30
4.0	6,400	0.15 to 0.35	8,000	0.15 to 0.35	6,400	0.15 to 0.35	6,400	0.15 to 0.35
5.0	5,100	0.15 to 0.35	6,400	0.15 to 0.35	5,100	0.15 to 0.35	5,100	0.15 to 0.35
6.0	4,300	0.18 to 0.40	5,300	0.18 to 0.40	4,300	0.18 to 0.40	4,300	0.18 to 0.40
7.0	3,700	0.18 to 0.45	4,500	0.18 to 0.45	3,700	0.18 to 0.40	3,700	0.18 to 0.40
8.0	3,200	0.20 to 0.50	4,000	0.20 to 0.50	3,200	0.20 to 0.45	3,200	0.20 to 0.45
9.0	2,900	0.20 to 0.50	3,500	0.20 to 0.50	2,900	0.20 to 0.45	2,900	0.20 to 0.45
10.0	2,600	0.20 to 0.50	3,200	0.20 to 0.50	2,600	0.20 to 0.45	2,600	0.20 to 0.45
11.0	2,400	0.20 to 0.55	2,900	0.20 to 0.55	2,400	0.20 to 0.50	2,400	0.20 to 0.50
12.0	2,200	0.20 to 0.55	2,700	0.20 to 0.55	2,200	0.20 to 0.50	2,200	0.20 to 0.50
13.0	1,900	0.22 to 0.60	2,500	0.22 to 0.60	1,900	0.22 to 0.55	1,900	0.22 to 0.55
14.0	1,600	0.22 to 0.60	2,300	0.22 to 0.60	1,600	0.22 to 0.55	1,600	0.22 to 0.55

Work Material	Cast Iron FC250 - 280HB		Ductile Cast Iron FCD450/FCD600 - 270HB	
Cutting Speed	60 to 120m/min		60 to 100m/min	
Dia. (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)	Spindle Speed (min ⁻¹)	Feed Rate (mm/rev)
3.0	8,500	0.15 to 0.35	8,500	0.15 to 0.30
4.0	6,400	0.15 to 0.40	6,400	0.15 to 0.35
5.0	5,100	0.15 to 0.45	5,100	0.15 to 0.35
6.0	4,300	0.18 to 0.50	4,300	0.18 to 0.40
7.0	3,700	0.18 to 0.55	3,700	0.18 to 0.45
8.0	3,200	0.20 to 0.60	3,200	0.20 to 0.50
9.0	2,900	0.20 to 0.60	2,900	0.20 to 0.50
10.0	2,600	0.22 to 0.65	2,600	0.22 to 0.55
11.0	2,400	0.22 to 0.65	2,400	0.22 to 0.55
12.0	2,200	0.25 to 0.70	2,200	0.25 to 0.60
13.0	1,900	0.25 to 0.70	1,900	0.25 to 0.60
14.0	1,600	0.25 to 0.75	1,600	0.25 to 0.65

1. The recommended cutting conditions above are for cases where internal supply of a water-soluble coolant is used.
2. Can also be used for MQL drilling.
3. If using non-water-soluble coolant, reduce the **cutting speed and feed rate** 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-drilling of a flat surface with a Flat MULTIDRILL MDF series drill is recommended.
7. When performing interrupted through drilling, reduce the feed rate to about half the feed rate used prior to this process.
8. If abnormalities such as noise or vibration occur, change the cutting conditions accordingly.

▶ MULTIDRILL MDH Series Made-To-Order Request Sheet ◀



■ Equipment Information

Manufacturer : _____

Type : Vertical Machining Centre Horizontal Machining Centre Lathe

Spindle : _____

Coolant : Water-soluble Oil-based MQL

Coolant Supply : Internal Coolant Supply External Coolant Supply

■ Workpiece Shape

■ Workpiece Information

Part Name : _____

Work Material : _____

Work Material Hardness : _____

Hole type : Through Hole Blind Hole

Interrupted Drilling : Yes No

Hole Depth : _____

Step Part : _____

■ Required Precision

Hole Dia. Tolerance : _____

Surface Roughness : _____

Hole Positioning Accuracy : _____

Other : _____

■ Current Tool

Cutting Conditions : $vc =$ _____ m/min $f =$ _____ mm/rev

Tool Life: _____

Tool Life Criteria: _____


Chamfered Cutting Edge: _____

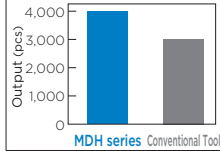
After filling in the required dimensions and other information, contact our nearest sales office or distributor.
 Feel free to contact us with other requests as well.


Company Name/Contact

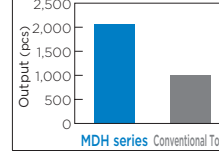
■ Remarks

Application Examples

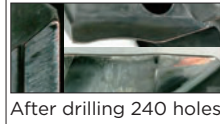
Steel SNCM420 Tool Holder		Sumitomo	Conventional Tool
	Tool	MDHI030S12H08	—
	Diameter (mm)	ø10.3	ø10.3
	L/D	8	8
	vc (m/min)	80	80
	f (mm/rev)	0.45	0.35
	Coolant	Wet (Water-soluble, Internal Coolant Supply)	Wet (Water-soluble, Internal Coolant Supply)
	Results	Approx. 1.3 times the efficiency and 1.35 times the tool life of conventional tools	





Steel SUJ2 Tooling Component		Sumitomo	Conventional Tool
	Tool	MDH0950S10H05	—
	Diameter (mm)	ø9.5	ø9.5
	L/D	5	5
	vc (m/min)	100	100
	f (mm/rev)	0.30	0.15
	Coolant	Wet (Oil-based, Internal Coolant Supply)	Wet (Oil-based, Internal Coolant Supply)
	Results	Twice the efficiency and at least twice the tool life of conventional tools	

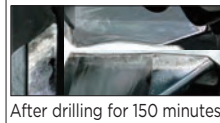



Steel SCM435H Ring Gear		Sumitomo	Conventional Tool
	Tool	MDHI350S14H05	—
	Diameter (mm)	ø13.5	ø13.5
	L/D	5	5
	vc (m/min)	91	91
	f (mm/rev)	0.40	0.20
	Coolant	Wet (Internal Coolant Supply)	Wet (Internal Coolant Supply)
	Results	Twice the efficiency and tool life of conventional tools	

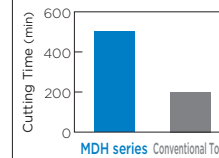



Steel SUJ2 Automotive Component		Sumitomo	Conventional Tool
	Tool	MDH0470S06H05	—
	Diameter (mm)	ø4.7	ø4.7
	L/D	5	5
	vc (m/min)	32	32
	f (mm/rev)	0.30	0.12
	Coolant	Wet (Internal Coolant Supply)	Wet (Internal Coolant Supply)
	Results	2.5 times the efficiency of conventional tools	

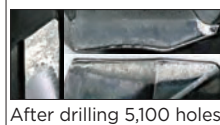
Cast Iron FC200 Housing		Sumitomo	Competitor's Product
	Tool	MDHI110S12H08	HSS Drills
	Diameter (mm)	ø11.1	ø11.1
	L/D	8	8
	vc (m/min)	80	—
	f (mm/rev)	0.50	—
	Coolant	Wet (Water-soluble, Internal Coolant Supply)	Wet (Water-soluble, Internal Coolant Supply)
	Results	High feed drilling is possible on a horizontal machining centre, even with 8D specifications (Prepared hole drilling: MDE110S12E02)	



Cast Iron FC250 Housing		Sumitomo	Competitor's Product
	Tool	MDH0870S10H05	—
	Diameter (mm)	ø8.7	ø8.7
	L/D	5	5
	vc (m/min)	85	85
	f (mm/rev)	0.40	0.20
	Coolant	Wet (Water-soluble, Internal Coolant Supply)	Wet (Water-soluble, Internal Coolant Supply)
	Results	Twice the efficiency and 2.5 times the tool life of competitors' products	



Cast Iron FC250 Industrial Machine Component		Sumitomo	Conventional Tool
	Tool	MDH0510S06H05	—
	Diameter (mm)	ø5.1	ø5.1
	L/D	5	5
	vc (m/min)	70	70
	f (mm/rev)	0.30	0.20
	Coolant	Wet (Water-soluble, External Coolant Supply)	Wet (Water-soluble, External Coolant Supply)
	Results	1.5 times the efficiency of conventional tools with the same tool life	



MEMO

A large grid of dotted lines for writing a memo. The grid consists of 20 columns and 30 rows of small squares, providing a structured space for text entry.



- Very hot or lengthy chips may be discharged while the machine is in operation. Therefore, machine guards, safety goggles or other protective covers must be used. Fire safety precautions must also be considered.

< SAFETY NOTES >

- Please handle with care as this product has sharp edges.
- Improper cutting conditions or mis-handling of the tool may result in breakages or projectiles. Therefore, please use the tool within its recommended conditions.

- When using non-water soluble cutting oil, precautions against fire must be taken and please ensure that a fire extinguisher is placed near the machine.

 **Sumitomo Electric Industries, Ltd.**

Hardmetal Division

Global Marketing Department : 1-1-1, Koyakita, Itami, Hyogo 664-0016, Japan

<https://www.sumitool.com/global>