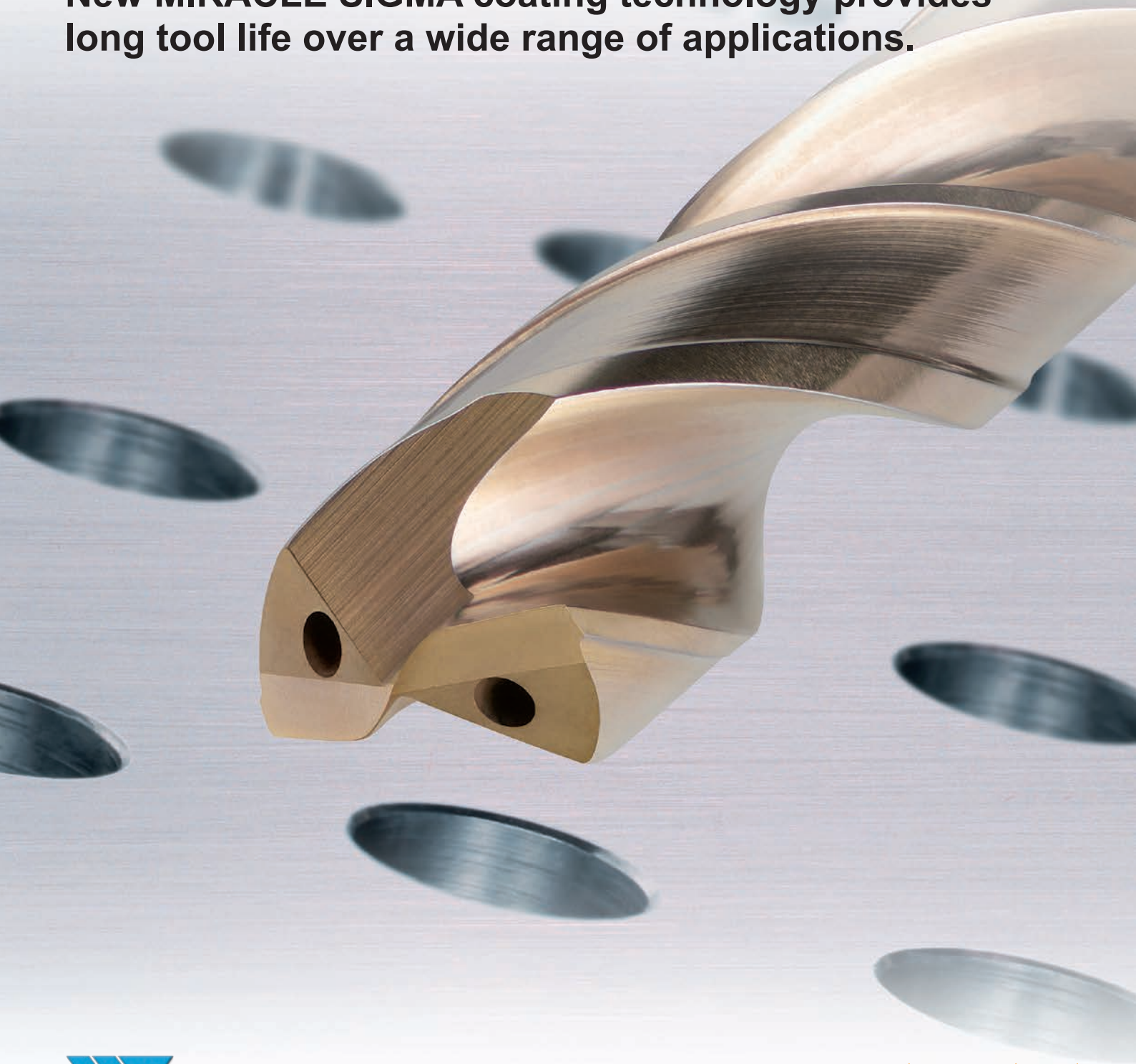


MINI-MVS

New generation solid carbide drills

New MIRACLE SIGMA coating technology provides long tool life over a wide range of applications.



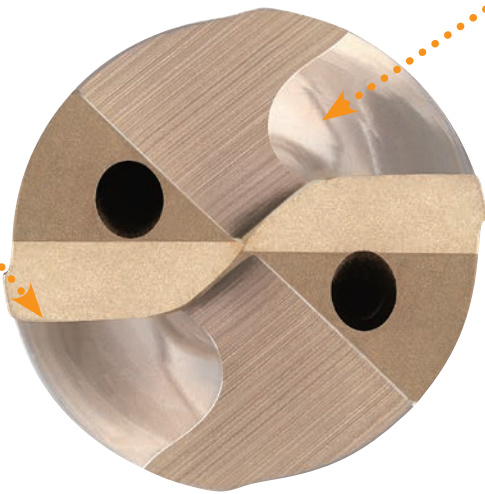
Solid Carbide Drill

MINI-MVS

Ideal for long tool life and process security when deep hole drilling.

Straight cutting edge

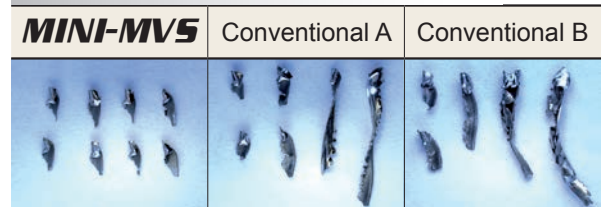
Improved chip evacuation and enhanced cutting edge strength.



New flute geometry

For improved chip evacuation.

Uniform, fine chips.



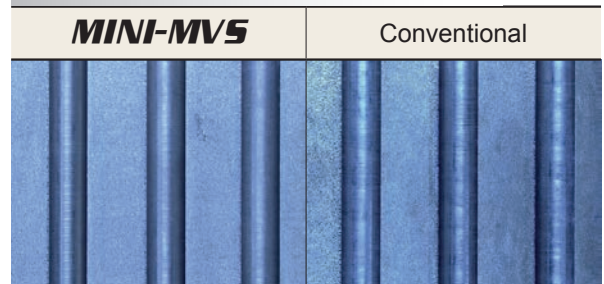
<Cutting conditions>

Drill : MVS0250X30S030
 Workpiece : DIN X5CrNi189
 Hole Depth : 75 mm (L/D=30)
 Cutting speed : 40 m/min
 Feed : 0.04 mm/rev
 Coolant : W.S.O.

Double margin

Provides high precision and balanced cutting.

Excellent surface roughness



Double margin

Double margin

<Cutting conditions>

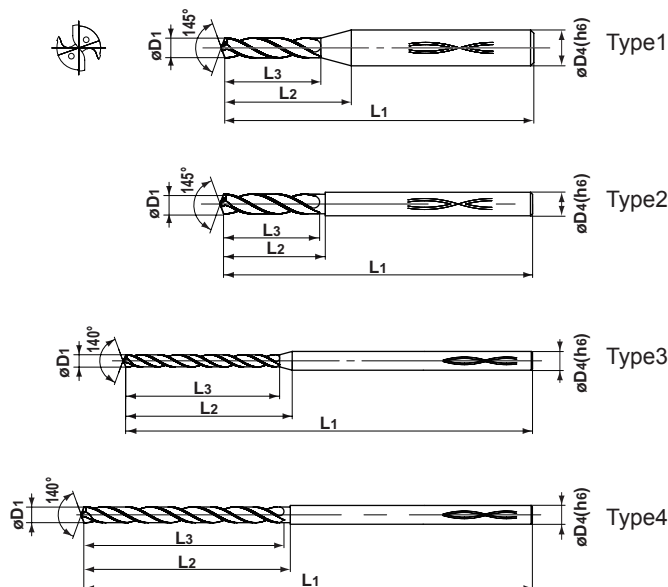
Drill : MVS0200X30S030
 Workpiece : DIN 41CrMo4
 Hole Depth : 60 mm
 Cutting speed : 30 m/min
 Feed : 0.04 mm/rev
 Coolant : W.S.O. (7MPa)

MINI-MVS

- Straight cutting edge that combines the chips evacuation and cutting edge strength improvement.
- Double margin achieves the optimum balance and precision in small diameter drill.



Order Number	1≤D1≤2.9
MVS-X02- (pilot drill)	+0.014 0
all others	0 -0.014
Order Number	D4
MVS	0 -0.006



D1 (mm)	L/D	Coolant (Int./Ext.)	DP1020	Order Number	L3	L2	L1	D4	Type
1.0	*S	Int.	●	MVS0100X02S030	5	8.7	55	3	1
	7	Int.	●	MVS0100X07S030	10	14	55	3	3
	12	Int.	●	MVS0100X12S030	15	19	55	3	3
	20	Int.	●	MVS0100X20S030	24	28	60	3	3
	25	Int.	●	MVS0100X25S030	28	32	66	3	3
	30	Int.	●	MVS0100X30S030	33	37	72	3	3
1.1	*S	Int.	●	MVS0110X02S030	5.4	8.9	55	3	1
	7	Int.	●	MVS0110X07S030	11	15	55	3	3
	12	Int.	●	MVS0110X12S030	17	21	55	3	3
	20	Int.	●	MVS0110X20S030	25	29	60	3	3
	25	Int.	●	MVS0110X25S030	31	34	66	3	3
	30	Int.	●	MVS0110X30S030	36	40	72	3	3
1.2	*S	Int.	●	MVS0120X02S030	6	9.4	55	3	1
	7	Int.	●	MVS0120X07S030	12	15	55	3	3
	12	Int.	●	MVS0120X12S030	18	21	55	3	3
	20	Int.	●	MVS0120X20S030	28	31	60	3	3
	25	Int.	●	MVS0120X25S030	34	37	66	3	3
	30	Int.	●	MVS0120X30S030	40	43	72	3	3
1.3	*S	Int.	●	MVS0130X02S030	6.4	9.6	55	3	1
	7	Int.	●	MVS0130X07S030	13	16	55	3	3
	12	Int.	●	MVS0130X12S030	20	23	55	3	3
	20	Int.	●	MVS0130X20S030	30	33	68	3	3
	25	Int.	●	MVS0130X25S030	36	40	74	3	3
	30	Int.	●	MVS0130X30S030	43	46	82	3	3

D1 (mm)	L/D	Coolant (Int./Ext.)	DP1020	Order Number	L3	L2	L1	D4	Type
1.4	*S	Int.	●	MVS0140X02S030	7	10	55	3	1
	7	Int.	●	MVS0140X07S030	14	17	55	3	3
	12	Int.	●	MVS0140X12S030	21	24	55	3	3
	20	Int.	●	MVS0140X20S030	32	35	68	3	3
	25	Int.	●	MVS0140X25S030	39	42	74	3	3
	30	Int.	●	MVS0140X30S030	46	49	82	3	3
1.5	*S	Int.	●	MVS0150X02S030	7.4	10.2	55	3	1
	7	Int.	●	MVS0150X07S030	15	18	55	3	3
	12	Int.	●	MVS0150X12S030	23	26	55	3	3
	20	Int.	●	MVS0150X20S030	35	37	68	3	3
	25	Int.	●	MVS0150X25S030	42	45	74	3	3
	30	Int.	●	MVS0150X30S030	50	52	82	3	3
1.6	*S	Int.	●	MVS0160X02S030	8	10.6	68	3	1
	7	Int.	●	MVS0160X07S030	16	19	68	3	3
	12	Int.	●	MVS0160X12S030	24	27	68	3	3
	20	Int.	●	MVS0160X20S030	37	39	78	3	3
	25	Int.	●	MVS0160X25S030	45	47	86	3	3
	30	Int.	●	MVS0160X30S030	53	55	95	3	3
1.7	*S	Int.	●	MVS0170X02S030	8.4	10.8	68	3	1
	7	Int.	●	MVS0170X07S030	17	19	68	3	3
	12	Int.	●	MVS0170X12S030	26	28	68	3	3
	20	Int.	●	MVS0170X20S030	39	42	78	3	3
	25	Int.	●	MVS0170X25S030	48	50	86	3	3
	30	Int.	●	MVS0170X30S030	56	59	95	3	3

*S=Pilot hole drill. Tolerance is +0.014 and hold depth is 2xD.

● : Inventory maintained.



NEW GENERATION SOLID CARBIDE DRILLS

MINI-MVS

D1 (mm)	L/D	Coolant (Int./Ext.)	DP1020	Order Number	L3	L2	L1	D4	Type
1.8	*S	Int.	●	MVS0180X02S030	9	11.2	68	3	1
	7	Int.	●	MVS0180X07S030	18	20	68	3	3
	12	Int.	●	MVS0180X12S030	27	29	68	3	3
	20	Int.	●	MVS0180X20S030	41	44	84	3	3
	25	Int.	●	MVS0180X25S030	50	53	94	3	3
	30	Int.	●	MVS0180X30S030	59	62	102	3	3
1.9	*S	Int.	●	MVS0190X02S030	9.4	11.5	68	3	1
	7	Int.	●	MVS0190X07S030	19	21	68	3	3
	12	Int.	●	MVS0190X12S030	29	31	68	3	3
	20	Int.	●	MVS0190X20S030	44	46	84	3	3
	25	Int.	●	MVS0190X25S030	53	55	94	3	3
	30	Int.	●	MVS0190X30S030	63	65	102	3	3
2.0	*S	Int.	●	MVS0200X02S030	10	11.9	68	3	1
	7	Int.	●	MVS0200X07S030	20	22	68	3	3
	12	Int.	●	MVS0200X12S030	30	32	68	3	3
	20	Int.	●	MVS0200X20S030	46	48	84	3	3
	25	Int.	●	MVS0200X25S030	56	58	94	3	3
	30	Int.	●	MVS0200X30S030	66	68	102	3	3
2.1	*S	Int.	●	MVS0210X02S030	10.4	12.1	74	3	1
	7	Int.	●	MVS0210X07S030	21	23	74	3	3
	12	Int.	●	MVS0210X12S030	32	34	74	3	3
	20	Int.	●	MVS0210X20S030	48	50	94	3	3
	25	Int.	●	MVS0210X25S030	59	60	107	3	3
	30	Int.	●	MVS0210X30S030	69	71	118	3	3
2.2	*S	Int.	●	MVS0220X02S030	11	12.5	74	3	1
	7	Int.	●	MVS0220X07S030	22	23	74	3	3
	12	Int.	●	MVS0220X12S030	33	34	74	3	3
	20	Int.	●	MVS0220X20S030	51	52	94	3	3
	25	Int.	●	MVS0220X25S030	62	63	107	3	3
	30	Int.	●	MVS0220X30S030	73	74	118	3	3
2.3	*S	Int.	●	MVS0230X02S030	11.4	12.7	74	3	1
	7	Int.	●	MVS0230X07S030	23	24	74	3	3
	12	Int.	●	MVS0230X12S030	35	36	74	3	3
	20	Int.	●	MVS0230X20S030	53	54	94	3	3
	25	Int.	●	MVS0230X25S030	64	66	107	3	3
	30	Int.	●	MVS0230X30S030	76	77	118	3	3
2.4	*S	Int.	●	MVS0240X02S030	12	13.1	74	3	1
	7	Int.	●	MVS0240X07S030	24	25	74	3	3
	12	Int.	●	MVS0240X12S030	36	37	74	3	3
	20	Int.	●	MVS0240X20S030	55	56	94	3	3
	25	Int.	●	MVS0240X25S030	67	68	107	3	3
	30	Int.	●	MVS0240X30S030	79	80	118	3	3
2.5	*S	Int.	●	MVS0250X02S030	12.4	13.3	74	3	1
	7	Int.	●	MVS0250X07S030	25	26	74	3	3
	12	Int.	●	MVS0250X12S030	38	39	74	3	3
	20	Int.	●	MVS0250X20S030	58	59	94	3	3
	25	Int.	●	MVS0250X25S030	70	71	107	3	3
	30	Int.	●	MVS0250X30S030	83	84	118	3	3

D1 (mm)	L/D	Coolant (Int./Ext.)	DP1020	Order Number	L3	L2	L1	D4	Type
2.6	*S	Int.	●	MVS0260X02S030	13	13	81	3	2
	7	Int.	●	MVS0260X07S030	26	26	81	3	4
	12	Int.	●	MVS0260X12S030	39	39	81	3	4
	20	Int.	●	MVS0260X20S030	60	60	103	3	4
	25	Int.	●	MVS0260X25S030	73	73	117	3	4
	30	Int.	●	MVS0260X30S030	86	86	132	3	4
2.7	*S	Int.	●	MVS0270X02S030	13.4	13.4	81	3	2
	7	Int.	●	MVS0270X07S030	27	27	81	3	4
	12	Int.	●	MVS0270X12S030	41	41	81	3	4
	20	Int.	●	MVS0270X20S030	62	62	103	3	4
	25	Int.	●	MVS0270X25S030	76	76	117	3	4
	30	Int.	●	MVS0270X30S030	89	89	132	3	4
2.8	*S	Int.	●	MVS0280X02S030	14	14	81	3	2
	7	Int.	●	MVS0280X07S030	28	28	81	3	4
	12	Int.	●	MVS0280X12S030	42	42	81	3	4
	20	Int.	●	MVS0280X20S030	64	64	103	3	4
	25	Int.	●	MVS0280X25S030	78	78	117	3	4
	30	Int.	●	MVS0280X30S030	92	92	132	3	4
2.9	*S	Int.	●	MVS0290X02S030	14.4	14.4	81	3	2
	7	Int.	●	MVS0290X07S030	29	29	81	3	4
	12	Int.	●	MVS0290X12S030	44	44	81	3	4
	20	Int.	●	MVS0290X20S030	67	67	103	3	4
	25	Int.	●	MVS0290X25S030	81	81	117	3	4
	30	Int.	●	MVS0290X30S030	96	96	132	3	4

Int.

*S=Pilot hole drill. Tolerance is +0.014 and hold depth is 2D.

● : Inventory maintained.

RECOMMENDED CUTTING CONDITIONS

Work Material	Ø (mm)	LxD	Mild Steel (≤180HB)		Carbon steel, Alloy steel (180—280HB)		Carbon steel, Alloy steel (280—350HB)	
			n (min ⁻¹)	Feed rate (Min.—Max.) (mm/rev)	n (min ⁻¹)	Feed rate (Min.—Max.) (mm/rev)	n (min ⁻¹)	Feed rate (Min.—Max.) (mm/rev)
1.0		S*,7xD	15900	0.04 (0.02—0.05)	15900	0.04 (0.02—0.05)	12700	0.04 (0.02—0.05)
		≥ 12xD	15900	0.02 (0.01—0.03)	12700	0.02 (0.01—0.03)	9500	0.02 (0.01—0.03)
1.5		S*,7xD	10600	0.05 (0.03—0.08)	10600	0.05 (0.03—0.08)	8400	0.05 (0.03—0.08)
		≥ 12xD	10600	0.05 (0.02—0.08)	8400	0.05 (0.03—0.08)	6300	0.05 (0.02—0.08)
2.0		S*,7xD	7900	0.07 (0.04—0.10)	7900	0.07 (0.04—0.10)	6300	0.07 (0.04—0.10)
		≥ 12xD	7900	0.07 (0.04—0.10)	7900	0.07 (0.04—0.10)	7900	0.07 (0.04—0.10)
2.5		S*,7xD	7600	0.09 (0.05—0.13)	7600	0.09 (0.05—0.13)	6300	0.09 (0.05—0.13)
		≥ 12xD	7600	0.09 (0.06—0.13)	6300	0.09 (0.06—0.13)	6300	0.08 (0.05—0.13)

Work Material	Ø (mm)	LxD	Austenitic Stainless Steel (≤200HB)		Gray Cast Iron (≤350MPa)		Ductile Cast Iron (≤450MPa)	
			n (min ⁻¹)	Feed rate (Min.—Max.) (mm/rev)	n (min ⁻¹)	Feed rate (Min.—Max.) (mm/rev)	n (min ⁻¹)	Feed rate (Min.—Max.) (mm/rev)
1.0		S*,7xD	9500	0.03 (0.02—0.05)	15900	0.04 (0.02—0.05)	12700	0.04 (0.02—0.05)
		≥ 12xD	9500	0.02 (0.01—0.03)	12700	0.02 (0.01—0.03)	9500	0.02 (0.01—0.03)
1.5		S*,7xD	6300	0.05 (0.03—0.07)	10600	0.05 (0.03—0.08)	8400	0.05 (0.03—0.08)
		≥ 12xD	6300	0.05 (0.02—0.08)	8400	0.05 (0.03—0.08)	6300	0.05 (0.02—0.08)
2.0		S*,7xD	4700	0.06 (0.04—0.08)	7900	0.07 (0.04—0.10)	6300	0.07 (0.04—0.10)
		≥ 12xD	4700	0.07 (0.04—0.10)	7900	0.07 (0.04—0.10)	7900	0.07 (0.04—0.10)
2.5		S*,7xD	5000	0.08 (0.05—0.10)	7600	0.09 (0.05—0.13)	6300	0.09 (0.05—0.13)
		≥ 12xD	3800	0.08 (0.05—0.12)	6300	0.09 (0.06—0.13)	6300	0.08 (0.05—0.12)

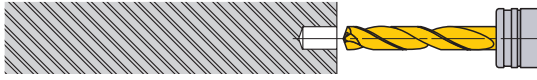
Work Material	Ø (mm)	LxD	Aluminium Alloy (Si<5%)		Heat Resistant Alloy	
			n (min ⁻¹)	Feed rate (Min.—Max.) (mm/rev)	n (min ⁻¹)	Feed rate (Min.—Max.) (mm/rev)
1.0		S*,7xD	19000	0.05 (0.03—0.08)	3100	0.02 (0.01—0.03)
		≥ 12xD	15900	0.05 (0.03—0.08)	3100	0.02 (0.01—0.03)
1.5		S*,7xD	16900	0.07 (0.05—0.12)	2100	0.03 (0.02—0.04)
		≥ 12xD	14800	0.08 (0.05—0.12)	2100	0.03 (0.02—0.04)
2.0		S*,7xD	14300	0.1 (0.06—0.15)	2300	0.04 (0.03—0.05)
		≥ 12xD	12700	0.11 (0.06—0.15)	2300	0.04 (0.03—0.05)
2.5		S*,7xD	12700	0.13 (0.08—0.20)	1900	0.05 (0.04—0.06)
		≥ 12xD	11400	0.14 (0.08—0.20)	1900	0.05 (0.04—0.06)

*S=Pilot hole drill. Hole depth is 2xD.

OPERATIONAL GUIDANCE FOR THE MINI-MVS LONG TYPE DRILL ($L/D \geq 10$)

FLAT FACE DRILLING ● Drilling a blind hole

1. Drilling a pilot hole



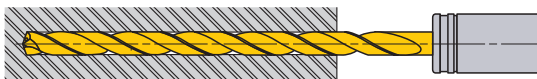
- ① Use a drill with a larger (flatter) point angle than the super long type. Use the shortest flute possible.
- ② Ensure a high precision hole is drilled for the guide.
- ③ Drill depth : Approx 1D.
(Adjust the pilot hole depth according to the length of the long type drill.)

2. Initial cutting with the long type drill



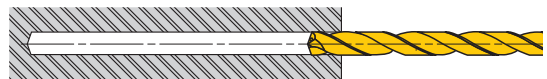
- ① Penetrate the guide hole at low revolution.
(Revolution 1000min⁻¹, feed rate 0.2–0.3mm/rev)
- ② Stop the long type drill 0.5–1mm short of the guide hole bottom.

3. Drill the deep hole



- ① Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

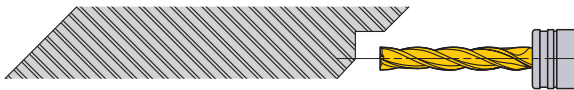
4. Drill retraction



- ① After drilling, lower the cutting revolution about 0.5–1mm short of the hole end. (Revolution 1000min⁻¹)
- ② Retract the drill to the pilot hole depth starting point at a feed rate of
- ③ 3000mm/min.
Finally, clear the hole at a cutting speed of 20–30m/min and feed rate of 0.2–0.3mm/rev.

INTERRUPTED DRILLING ● Drilling and breaking through on irregular faces or angles

1. Spot facing



- ① Machine a flat or the irregular face by using an end mill or slot drill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

2. Drilling a pilot hole



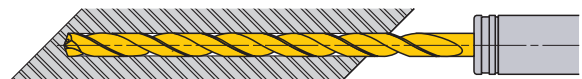
- ① Use a drill with a larger (flatter) point angle than the super long type. Use the shortest flute possible.
- ② Ensure a high precision hole is drilled for the guide.
- ③ Drill depth : Approx 1D.
(Adjust the pilot hole depth according to the length of the long type drill.)

3. Initial cutting with the long type drill



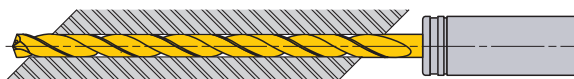
- ① Penetrate the guide hole at a low revolution.
(Revolution 1000min⁻¹, feed rate 0.2–0.3mm/rev)
- ② Stop the long type drill 0.5–1mm short of the guide hole bottom.

4. Drill the deep hole



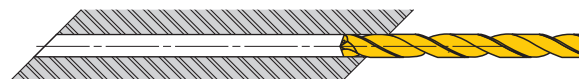
- ① Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.
- ② Feed as usual until breaking through.

5. Breaking through



- ① When breaking through, the cutting edge can be damaged.
- ② Recommend about half rate of the usual feed rate after breaking through.

6. Drill retraction

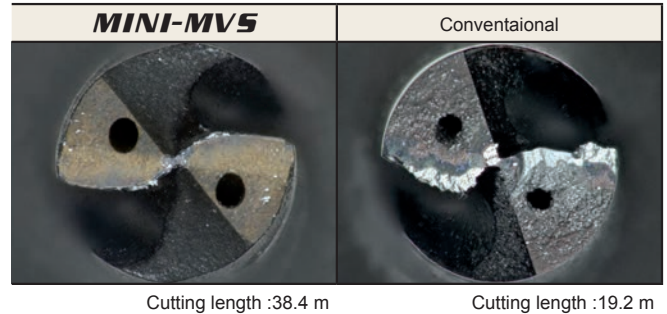
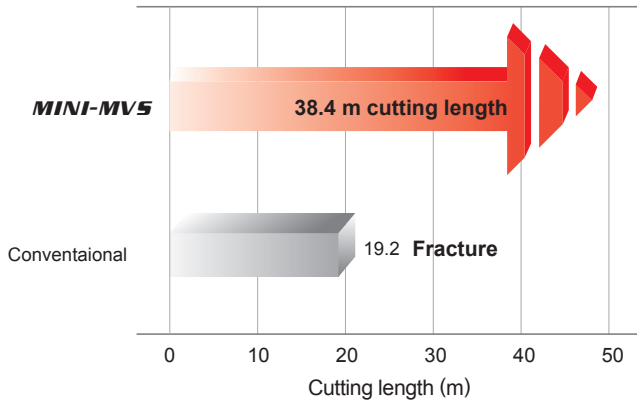


- ① Finally clear the hole at a revolution speed 1000min⁻¹ and feed rate of 0.2–0.3mm/rev.
- ② Retract the drill to the pilot hole depth starting point at a feed rate of 3000mm/min.

Cutting Performance

Alloy steel

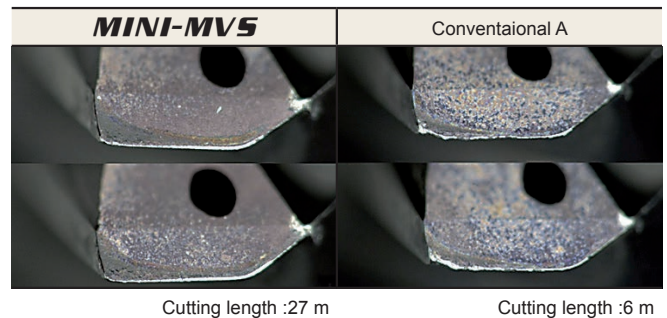
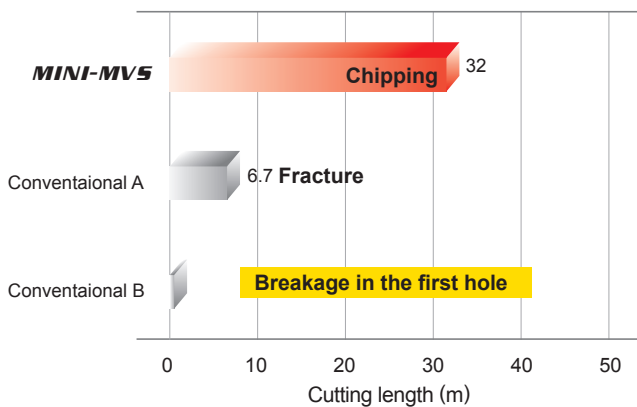
MINI-MVS gives a stable performance and double tool life.



<Cutting conditions>
 Drill : MVS0100X07S030 Cutting speed : 40 m/min
 Workpiece : DIN 41CrMo4 Feed : 0.04 mm/rev
 Hole Depth : 4 mm (L/D=4) Coolant : W.S.O.

Stainless steel

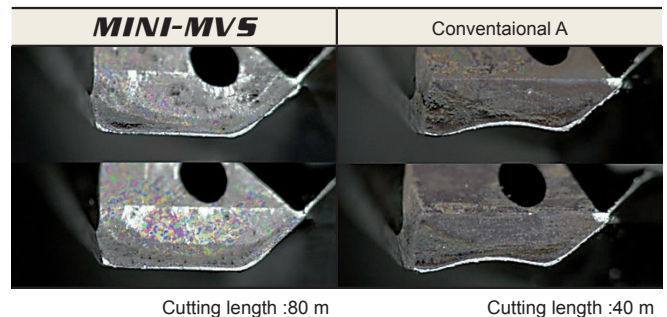
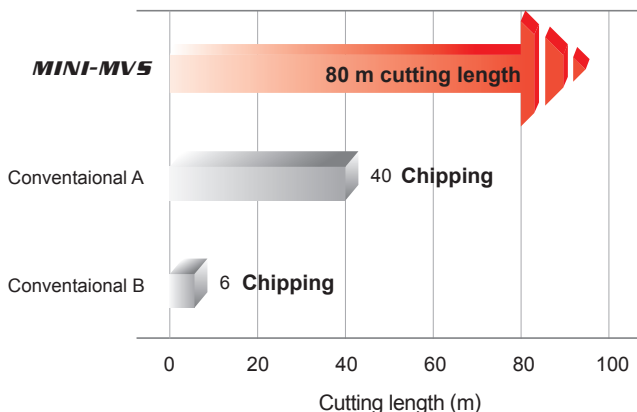
MINI-MVS provides stability and long tool life even when drilling stainless steel.



<Cutting conditions>
 Drill : MVS0200X02S030 Cutting speed : 30 m/min
 Workpiece : DIN X5CrNi189 Feed : 0.06 mm/rev
 Hole Depth : 4 mm (L/D=2) Coolant : W.S.O. (7MPa)

Stainless steel (L/D=30)

MINI-MVS provides stability and long tool life even when drilling deep holes in stainless steel.



<Cutting conditions>
 Drill : MVS0200X30S030 Cutting speed : 30 m/min
 Workpiece : DIN X5CrNi189 Feed : 0.06 mm/rev
 Hole Depth : 60 mm (L/D=30) Coolant : W.S.O. (7MPa)



MINI-MVS



www.mitsubishicarbide.com

MMC HARTMETALL GmbH

Comeniusstr. 2, 40670 Meerbusch, Germany
Tel. +49-2159-9189-0 Fax +49-2159-918966
e-mail admin@mmchg.de

MMC HARDMETAL U.K. LTD.

Mitsubishi House, Galena Close, Tamworth, Staffs. B77 4AS, U.K.
Tel. +44-1827-312312 Fax +44-1827-312314
e-mail sales@mitsubishicarbide.co.uk

MMC METAL FRANCE s.a.r.l.

6, Rue Jacques Monod, 91400 Orsay, France
Tel. +33-1-69 35 53 53 Fax +33-1-69 35 53 50
e-mail mmfsales@mmc-metal-france.fr

MITSUBISHI MATERIALS ESPAÑA, S.A.

Calle Emperador 2, 46136 Museros/Valencia, Spain
Tel. +34-96-144-1711 Fax +34-96-144-3786
e-mail mme@mmevalencia.com

MMC ITALIA S.r.l.

Via Montefeltro 6/A, 20156 Milano, Italy
Tel. +39-02 93 77 03 1 Fax +39-02 93 58 90 93
e-mail info@mmc-italia.it

MMC HARDMETAL POLAND SP. z o.o.

Al. Armii Krajowej 61, 50-541 Wrocław, Poland
Tel. +48-71335-16-20 Fax +48-71335-16-21
e-mail sales@mitsubishicarbide.com.pl

MMC HARDMETAL RUSSIA OOO LTD.

Electozavodskaya Str. 24, build. 3 107023 r. Moscow, Russia
Tel. +7-495-725-58-85 Fax. +7-495-981-39-79
e-mail info@mmc-carbide.ru

MMC Hartmetall GmbH Almany - İzmir Merkez Şubesi

Adalet Mahallesi Anadolu Caddesi No: 41-1 / 15001 35580 Bayraklı/İzmir TURKY
Tel. +90 232 5015000 Fax +90-232-5015007
e-mail info@mmchg.com.tr



EXP-14-E010
2015.2.E(-)
Printed in Germany