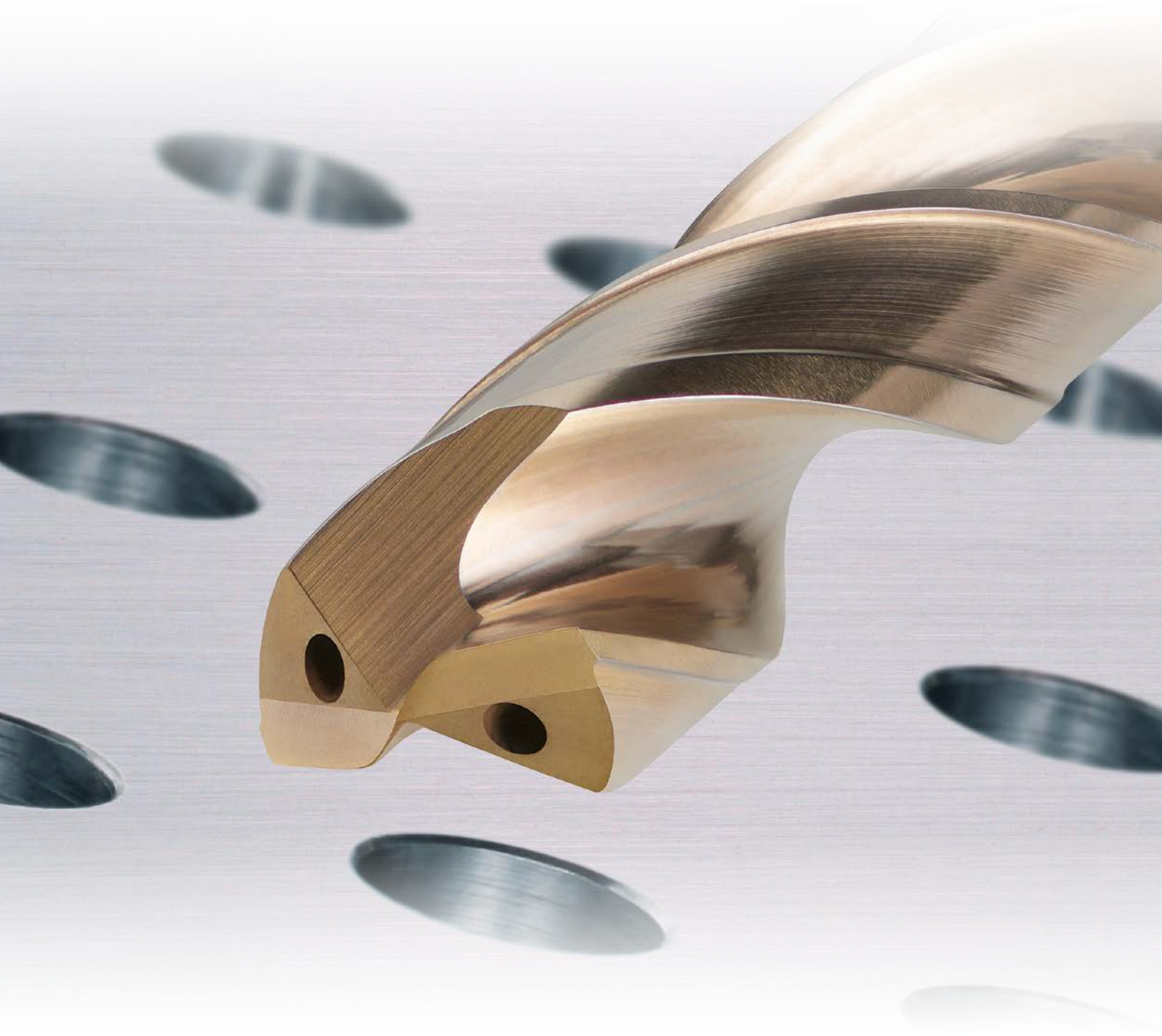
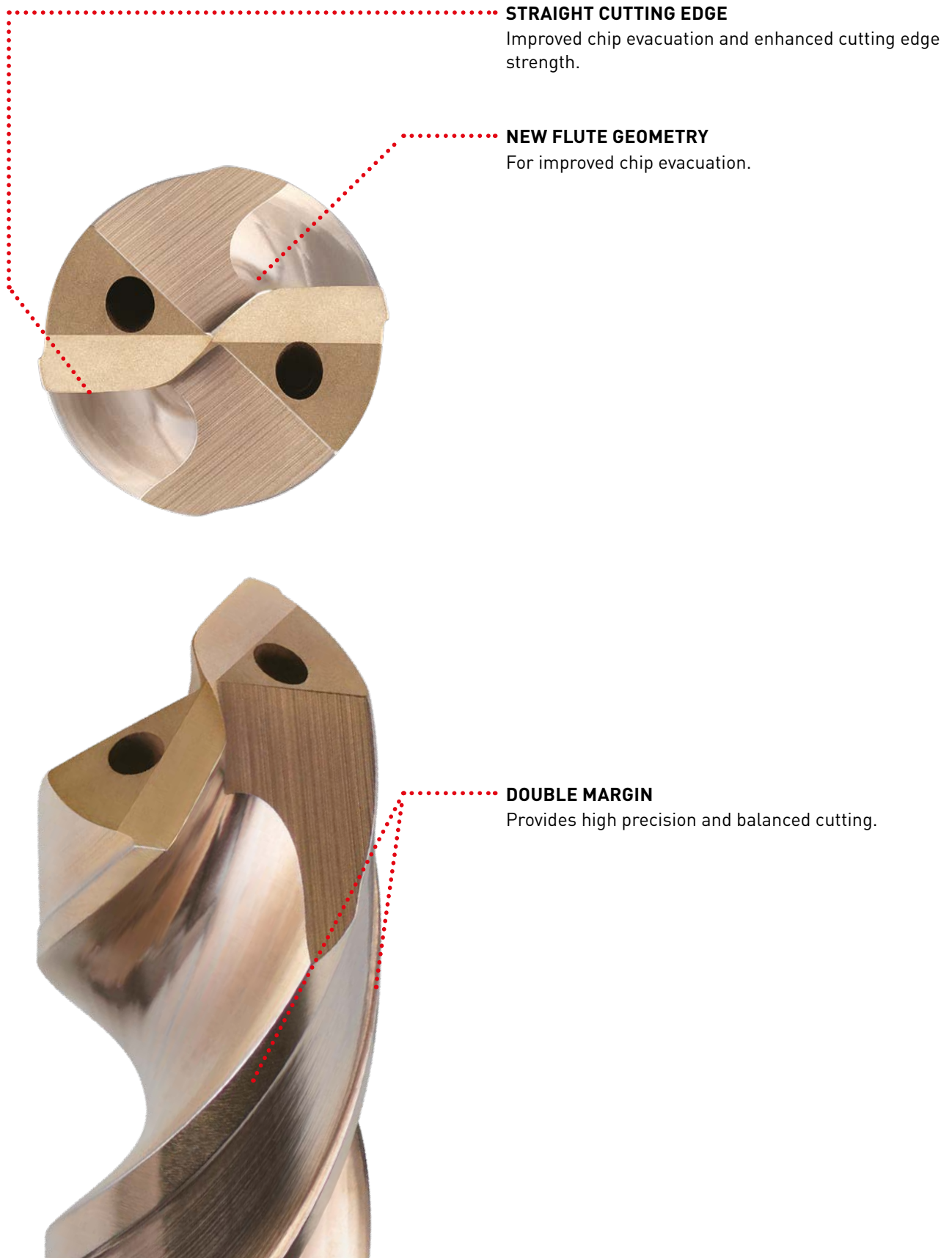

MINI-MVS

NEW GENERATION SOLID CARBIDE DRILLS



MINI-MVS

IDEAL FOR LONG TOOL LIFE AND PROCESS SECURITY
WHEN DEEP HOLE DRILLING.



MINI-MVS

CUTTING PERFORMANCE

UNIFORM, FINE CHIPS.

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



MINI-MVS



Conventional A



Conventional B

EXCELLENT SURFACE ROUGHNESS

Drill	MVS0200X30S030
Workpiece	DIN 41CrMo4
Hole Depth L/D = 30 (mm)	60
Vc (m/min)	30
f (mm/rev)	0.04
Coolant	W.S.O. (7 MPa)



MINI-MVS



Conventional

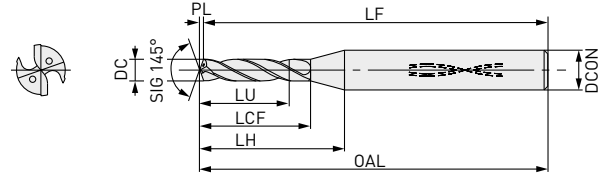
MINI-MVS



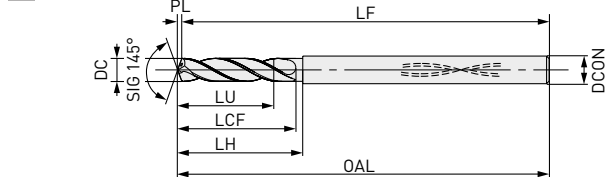
NEW GENERATION SOLID CARBIDE DRILLS



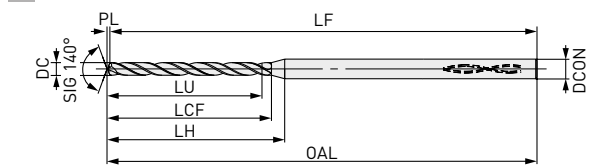
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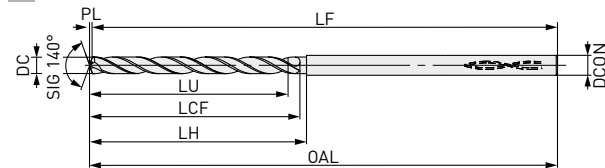
2



3



4



Order number	1 ≤ DC ≤ 2.9
MVS-X02-(pilot drill)	0.014
Others	0
	-0.014



Order number	DCON
MVS	0
	-0.006



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

Order number	DP1020	DC	DCON	L/D	LU	LCF	LH	OAL	LF	PL	Type
MVS0100X02S030	●	1.0	3	*2	2.2	5.2	8.9	55.2	55	0.2	1
MVS0100X07S030	●		3	7	7.2	10.2	14.2	55.2	55	0.2	3
MVS0100X12S030	●		3	12	12.2	15.2	19.2	55.2	55	0.2	3
MVS0100X20S030	●		3	20	20.2	24.2	28.2	60.2	60	0.2	3
MVS0100X25S030	●		3	25	25.2	28.2	32.2	66.2	66	0.2	3
MVS0100X30S030	●		3	30	30.2	33.2	37.2	72.2	72	0.2	3

* 2 = Pilot hole drill. Tolerance is +0.014 and hole depth is DCx2.



MINI-MVS

Order number	DP1020	DC	DCON	L/D	LU	LCF	LH	OAL	LF	PL	Type
MVS0110X02S030	●	1.1	3	*2	2.4	5.6	9.1	55.2	55	0.2	1
MVS0110X07S030	●		3	7	7.9	11.2	15.2	55.2	55	0.2	3
MVS0110X12S030	●		3	12	13.4	17.2	21.2	55.2	55	0.2	3
MVS0110X20S030	●		3	20	22.2	25.2	29.2	60.2	60	0.2	3
MVS0110X25S030	●		3	25	27.7	31.2	34.2	66.2	66	0.2	3
MVS0110X30S030	●		3	30	33.2	36.2	40.2	72.2	72	0.2	3
MVS0120X02S030	●	1.2	3	*2	2.6	6.2	9.6	55.2	55	0.2	1
MVS0120X07S030	●		3	7	8.6	12.2	15.2	55.2	55	0.2	3
MVS0120X12S030	●		3	12	14.6	18.2	21.2	55.2	55	0.2	3
MVS0120X20S030	●		3	20	24.2	28.2	31.2	60.2	60	0.2	3
MVS0120X25S030	●		3	25	30.2	34.2	37.2	66.2	66	0.2	3
MVS0120X30S030	●		3	30	36.2	40.2	43.2	72.2	72	0.2	3
MVS0130X02S030	●	1.3	3	*2	2.8	6.6	9.8	55.2	55	0.2	1
MVS0130X07S030	●		3	7	9.3	13.2	16.2	55.2	55	0.2	3
MVS0130X12S030	●		3	12	15.8	20.2	23.2	55.2	55	0.2	3
MVS0130X20S030	●		3	20	26.2	30.2	33.2	68.2	68	0.2	3
MVS0130X25S030	●		3	25	32.7	36.2	40.2	74.2	74	0.2	3
MVS0130X30S030	●		3	30	39.2	43.2	46.2	82.2	82	0.2	3
MVS0140X02S030	●	1.4	3	*2	3.0	7.2	10.2	55.2	55	0.2	1
MVS0140X07S030	●		3	7	10.1	14.3	17.3	55.3	55	0.3	3
MVS0140X12S030	●		3	12	17.1	21.3	24.3	55.3	55	0.3	3
MVS0140X20S030	●		3	20	28.3	32.3	35.3	68.3	68	0.3	3
MVS0140X25S030	●		3	25	35.3	39.3	42.3	74.3	74	0.3	3
MVS0140X30S030	●		3	30	42.3	46.3	49.3	82.3	82	0.3	3
MVS0150X02S030	●	1.5	3	*2	3.2	7.6	10.4	55.2	55	0.2	1
MVS0150X07S030	●		3	7	10.8	15.3	18.3	55.3	55	0.3	3
MVS0150X12S030	●		3	12	18.3	23.3	26.3	55.3	55	0.3	3
MVS0150X20S030	●		3	20	30.3	35.3	37.3	68.3	68	0.3	3
MVS0150X25S030	●		3	25	37.8	42.3	45.3	74.3	74	0.3	3
MVS0150X30S030	●		3	30	45.3	50.3	52.3	82.3	82	0.3	3
MVS0160X02S030	●	1.6	3	*2	3.5	8.3	10.9	68.3	68	0.3	1
MVS0160X07S030	●		3	7	11.5	16.3	19.3	68.3	68	0.3	3
MVS0160X12S030	●		3	12	19.5	24.3	27.3	68.3	68	0.3	3
MVS0160X20S030	●		3	20	32.3	37.3	39.3	78.3	78	0.3	3
MVS0160X25S030	●		3	25	40.3	45.3	47.3	86.3	86	0.3	3
MVS0160X30S030	●		3	30	48.3	53.3	55.3	95.3	95	0.3	3
MVS0170X02S030	●	1.7	3	*2	3.7	8.7	11.1	68.3	68	0.3	1
MVS0170X07S030	●		3	7	12.2	17.3	19.3	68.3	68	0.3	3
MVS0170X12S030	●		3	12	20.7	26.3	28.3	68.3	68	0.3	3
MVS0170X20S030	●		3	20	34.3	39.3	42.3	78.3	78	0.3	3
MVS0170X25S030	●		3	25	42.8	48.3	50.3	86.3	86	0.3	3
MVS0170X30S030	●		3	30	51.3	56.3	59.3	95.3	95	0.3	3
MVS0180X02S030	●	1.8	3	*2	3.9	9.3	11.5	68.3	68	0.3	1
MVS0180X07S030	●		3	7	12.9	18.3	20.3	68.3	68	0.3	3
MVS0180X12S030	●		3	12	21.9	27.3	29.3	68.3	68	0.3	3
MVS0180X20S030	●		3	20	36.3	41.3	44.3	84.3	84	0.3	3
MVS0180X25S030	●		3	25	45.3	50.3	53.3	94.3	94	0.3	3
MVS0180X30S030	●		3	30	54.3	59.3	62.3	102.3	102	0.3	3

* 2 = Pilot hole drill. Tolerance is +0.014 and hole depth is DCx2.



MINI-MVS

Order number	DP1020	DC	DCON	L/D	LU	LCF	LH	OAL	LF	PL	Type
MVS0190X02S030	●	1.9	3	*2	4.1	9.7	11.8	68.3	68	0.3	1
MVS0190X07S030	●		3	7	13.6	19.3	21.3	68.3	68	0.3	3
MVS0190X12S030	●		3	12	23.1	29.3	31.3	68.3	68	0.3	3
MVS0190X20S030	●		3	20	38.3	44.3	46.3	84.3	84	0.3	3
MVS0190X25S030	●		3	25	47.8	53.3	55.3	94.3	94	0.3	3
MVS0190X30S030	●		3	30	57.3	63.3	65.3	102.3	102	0.3	3
MVS0200X02S030	●	2.0	3	*2	4.3	10.3	12.2	68.3	68	0.3	1
MVS0200X07S030	●		3	7	14.4	20.4	22.4	68.4	68	0.4	3
MVS0200X12S030	●		3	12	24.4	30.4	32.4	68.4	68	0.4	3
MVS0200X20S030	●		3	20	40.4	46.4	48.4	84.4	84	0.4	3
MVS0200X25S030	●		3	25	50.4	56.4	58.4	94.4	94	0.4	3
MVS0200X30S030	●		3	30	60.4	66.4	68.4	102.4	102	0.4	3
MVS0210X02S030	●	2.1	3	*2	4.5	10.7	12.4	74.3	74	0.3	1
MVS0210X07S030	●		3	7	15.1	21.4	23.4	74.4	74	0.4	3
MVS0210X12S030	●		3	12	25.6	32.4	34.4	74.4	74	0.4	3
MVS0210X20S030	●		3	20	42.4	48.4	50.4	94.4	94	0.4	3
MVS0210X25S030	●		3	25	52.9	59.4	60.4	107.4	107	0.4	3
MVS0210X30S030	●		3	30	63.4	69.4	71.4	118.4	118	0.4	3
MVS0220X02S030	●	2.2	3	*2	4.7	11.3	12.8	74.3	74	0.3	1
MVS0220X07S030	●		3	7	15.8	22.4	23.4	74.4	74	0.4	3
MVS0220X12S030	●		3	12	26.8	33.4	34.4	74.4	74	0.4	3
MVS0220X20S030	●		3	20	44.4	51.4	52.4	94.4	94	0.4	3
MVS0220X25S030	●		3	25	55.4	62.4	63.4	107.4	107	0.4	3
MVS0220X30S030	●		3	30	66.4	73.4	74.4	118.4	118	0.4	3
MVS0230X02S030	●	2.3	3	*2	5.0	11.8	13.1	74.4	74	0.4	1
MVS0230X07S030	●		3	7	16.5	23.4	24.4	74.4	74	0.4	3
MVS0230X12S030	●		3	12	28.0	35.4	36.4	74.4	74	0.4	3
MVS0230X20S030	●		3	20	46.4	53.4	54.4	94.4	94	0.4	3
MVS0230X25S030	●		3	25	57.9	64.4	66.4	107.4	107	0.4	3
MVS0230X30S030	●		3	30	69.4	76.4	77.4	118.4	118	0.4	3
MVS0240X02S030	●	2.4	3	*2	5.2	12.4	13.5	74.4	74	0.4	1
MVS0240X07S030	●		3	7	17.2	24.4	25.4	74.4	74	0.4	3
MVS0240X12S030	●		3	12	29.2	36.4	37.4	74.4	74	0.4	3
MVS0240X20S030	●		3	20	48.4	55.4	56.4	94.4	94	0.4	3
MVS0240X25S030	●		3	25	60.4	67.4	68.4	107.4	107	0.4	3
MVS0240X30S030	●		3	30	72.4	79.4	80.4	118.4	118	0.4	3
MVS0250X02S030	●	2.5	3	*2	5.4	12.8	13.7	74.4	74	0.4	1
MVS0250X07S030	●		3	7	18.0	25.5	26.5	74.5	74	0.5	3
MVS0250X12S030	●		3	12	30.5	38.5	39.5	74.5	74	0.5	3
MVS0250X20S030	●		3	20	50.5	58.5	59.5	94.5	94	0.5	3
MVS0250X25S030	●		3	25	63.0	70.5	71.5	107.5	107	0.5	3
MVS0250X30S030	●		3	30	75.5	83.5	84.5	118.5	118	0.5	3
MVS0260X02S030	●	2.6	3	*2	5.6	13.4	13.4	81.4	81	0.4	2
MVS0260X07S030	●		3	7	18.7	26.5	26.5	81.5	81	0.5	4
MVS0260X12S030	●		3	12	31.7	39.5	39.5	81.5	81	0.5	4
MVS0260X20S030	●		3	20	52.5	60.5	60.5	103.5	103	0.5	4
MVS0260X25S030	●		3	25	65.5	73.5	73.5	117.5	117	0.5	4
MVS0260X30S030	●		3	30	78.5	86.5	86.5	132.5	132	0.5	4

* 2 = Pilot hole drill. Tolerance is +0.014 and hole depth is DCx2.



MINI-MVS

Order number	DP1020	DC	DCON	L/D	LU	LCF	LH	OAL	LF	PL	Type
MVS0270X02S030	●	2.7	3	*2	5.8	13.8	13.8	81.4	81	0.4	2
MVS0270X07S030	●		3	7	19.4	27.5	27.5	81.5	81	0.5	4
MVS0270X12S030	●		3	12	32.9	41.5	41.5	81.5	81	0.5	4
MVS0270X20S030	●		3	20	54.5	62.5	62.5	103.5	103	0.5	4
MVS0270X25S030	●		3	25	68.0	76.5	76.5	117.5	117	0.5	4
MVS0270X30S030	●		3	30	81.5	89.5	89.5	132.5	132	0.5	4
MVS0280X02S030	●	2.8	3	*2	6.0	14.4	14.4	81.4	81	0.4	2
MVS0280X07S030	●		3	7	20.1	28.5	28.5	81.5	81	0.5	4
MVS0280X12S030	●		3	12	34.1	42.5	42.5	81.5	81	0.5	4
MVS0280X20S030	●		3	20	56.5	64.5	64.5	103.5	103	0.5	4
MVS0280X25S030	●		3	25	70.5	78.5	78.5	117.5	117	0.5	4
MVS0280X30S030	●		3	30	84.5	92.5	92.5	132.5	132	0.5	4
MVS0290X02S030	●	2.9	3	*2	6.3	14.9	14.9	81.5	81	0.5	2
MVS0290X07S030	●		3	7	20.8	29.5	29.5	81.5	81	0.5	4
MVS0290X12S030	●		3	12	35.3	44.5	44.5	81.5	81	0.5	4
MVS0290X20S030	●		3	20	58.5	67.5	67.5	103.5	103	0.5	4
MVS0290X25S030	●		3	25	73.0	81.5	81.5	117.5	117	0.5	4
MVS0290X30S030	●		3	30	87.5	96.5	96.5	132.5	132	0.5	4

* 2 = Pilot hole drill. Tolerance is +0.014 and hole depth is DCx2.



MINI-MVS

RECOMMENDED CUTTING CONDITIONS

Material	DC	L/D	n	f	
P Mild steel (≤180HB)	1.0	2*,7DC	15900	0.04 (0.02-0.05)	
		≥ 12DC	15900	0.02 (0.01-0.03)	
	1.5	2*,7DC	10600	0.05 (0.03-0.08)	
		≥ 12DC	10600	0.05 (0.02-0.08)	
	2.0	2*,7DC	7900	0.07 (0.04-0.10)	
		≥ 12DC	7900	0.07 (0.04-0.10)	
	2.5	2*,7DC	7600	0.09 (0.05-0.13)	
		≥ 12DC	7600	0.09 (0.06-0.13)	
	Carbon steel (180-280HB)	1.0	2*,7DC	15900	0.04 (0.02-0.05)
			≥ 12DC	12700	0.02 (0.01-0.03)
1.5		2*,7DC	10600	0.05 (0.03-0.08)	
		≥ 12DC	8400	0.05 (0.03-0.08)	
2.0		2*,7DC	7900	0.07 (0.04-0.10)	
		≥ 12DC	7900	0.07 (0.04-0.10)	
2.5		2*,7DC	7600	0.09 (0.05-0.13)	
		≥ 12DC	6300	0.09 (0.06-0.13)	
Alloy steel (280-350HB)		1.0	2*,7DC	12700	0.04 (0.02-0.05)
			≥ 12DC	9500	0.02 (0.01-0.03)
	1.5	2*,7DC	8400	0.05 (0.03-0.08)	
		≥ 12DC	6300	0.05 (0.02-0.08)	
	2.0	2*,7DC	6300	0.07 (0.04-0.10)	
		≥ 12DC	7900	0.07 (0.04-0.10)	
	2.5	2*,7DC	6300	0.09 (0.05-0.13)	
		≥ 12DC	6300	0.08 (0.05-0.13)	
	M Austenitic stainless steel (≤200HB)	1.0	2*,7DC	9500	0.03 (0.02-0.05)
			≥ 12DC	9500	0.02 (0.01-0.03)
1.5		2*,7DC	6300	0.05 (0.03-0.07)	
		≥ 12DC	6300	0.05 (0.02-0.08)	
2.0		2*,7DC	4700	0.06 (0.04-0.08)	
		≥ 12DC	4700	0.07 (0.04-0.10)	
2.5		2*,7DC	5000	0.08 (0.05-0.10)	
		≥ 12DC	3800	0.08 (0.05-0.12)	
K Gray cast iron (<350MPa)		1.0	2*,7DC	15900	0.04 (0.02-0.05)
			≥ 12DC	12700	0.02 (0.01-0.03)
	1.5	2*,7DC	10600	0.05 (0.03-0.08)	
		≥ 12DC	8400	0.05 (0.03-0.08)	
	2.0	2*,7DC	7900	0.07 (0.04-0.10)	
		≥ 12DC	7900	0.07 (0.04-0.10)	
	2.5	2*,7DC	7600	0.09 (0.05-0.13)	
		≥ 12DC	6300	0.09 (0.06-0.13)	
	Ductile cast iron (<450MPa)	1.0	2*,7DC	12700	0.04 (0.02-0.05)
			≥ 12DC	9500	0.02 (0.01-0.03)
1.5		2*,7DC	8400	0.05 (0.03-0.08)	
		≥ 12DC	6300	0.05 (0.02-0.08)	
2.0		2*,7DC	6300	0.07 (0.04-0.10)	
		≥ 12DC	7900	0.07 (0.04-0.10)	
2.5		2*,7DC	6300	0.09 (0.05-0.13)	
		≥ 12DC	6300	0.08 (0.05-0.12)	

MINI-MVS

RECOMMENDED CUTTING CONDITIONS

Material	DC	L/D	n	f
N Aluminium alloy (Si<5%)	1.0	2*,7DC	19000	0.05 (0.03-0.08)
		≥ 12DC	15900	0.05 (0.03-0.08)
	1.5	2*,7DC	16900	0.07 (0.05-0.12)
		≥ 12DC	14800	0.08 (0.05-0.12)
	2.0	2*,7DC	14300	0.10 (0.06-0.15)
		≥ 12DC	12700	0.11 (0.06-0.15)
2.5	2*,7DC	12700	0.13 (0.08-0.20)	
	≥ 12DC	11400	0.14 (0.08-0.20)	
N Heat resistant alloy	1.0	2*,7DC	3100	0.02 (0.01-0.03)
		≥ 12DC	3100	0.02 (0.01-0.03)
	1.5	2*,7DC	2100	0.03 (0.02-0.04)
		≥ 12DC	2100	0.03 (0.02-0.04)
	2.0	2*,7DC	2300	0.04 (0.03-0.05)
		≥ 12DC	2300	0.04 (0.03-0.05)
	2.5	2*,7DC	1900	0.05 (0.04-0.06)
		≥ 12DC	1900	0.05 (0.04-0.06)

* 2 = Pilot hole drill. Hole depth is DCx2.

OPERATIONAL GUIDANCE

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

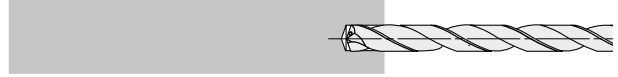
FLAT FACE DRILLING DRILLING A BLIND HOLE

1. Drilling a pilot hole



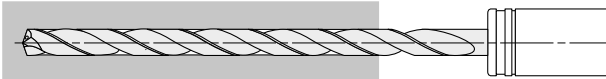
1. Use a drill with a larger (flatter) point angle than the super long type. Use the shortest flute possible.
2. Ensure a high precision hole is drilled for the guide.
3. Drill depth : Approx 1DC or deeper.
(Adjust the pilot hole depth according to the length of the super long type drill.)

2. Initial cutting with the long type drill



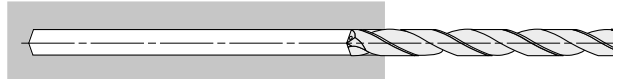
1. Penetrate the pilot hole at low revolution.
(Revolution 1000 min^{-1} , feed rate $0.2 - 0.3 \text{ mm/rev}$)
2. Stop the long type drill $0.5 - 1 \text{ mm}$ short of the pilot hole bottom.

3. Drill the deep hole



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

4. Drill retraction






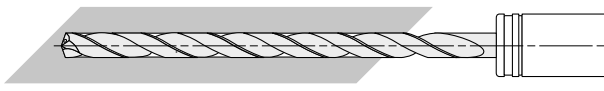
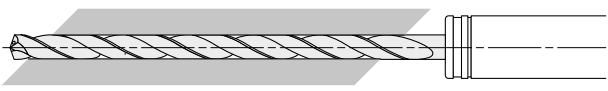
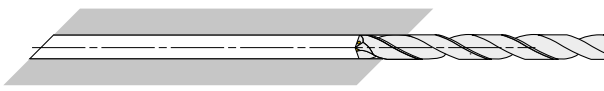
1. After drilling, lower the cutting revolution about $0.5 - 1 \text{ mm}$ short of the hole end. (Revolution of around 1000 min^{-1})
2. Retract the drill to the pilot hole depth starting point at a feed rate of 3000 mm/min .
3. Finally, clear the hole at a cutting speed of $20 - 30 \text{ m/min}$ and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

OPERATIONAL GUIDANCE

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

INTERRUPTED DRILLING

DRILLING AND BREAKING THROUGH ON IRREGULAR FACES OR ANGLES

<p>1. Spot facing</p>  <ol style="list-style-type: none"> 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. 	<p>2. Drilling a pilot hole</p>  <ol style="list-style-type: none"> 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 1DC or deeper. (Adjust the pilot hole depth according to the length of the super long type drill.)
<p>3. Initial cutting with the long type drill</p>  <ol style="list-style-type: none"> 1. Penetrate the guide hole at a low revolution. (Revolution 1000 min⁻¹, feed rate 0.2 – 0.3 mm/rev) 2. Stop the long type drill 0.5 – 1 mm short of the pilot hole bottom. 	<p>4. Drill the deep hole</p>  <ol style="list-style-type: none"> 1. Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.
<p>5. Breaking through</p>  <ol style="list-style-type: none"> 1. When breaking through, the cutting edge can be damaged. 2. Lower the feed rate when penetrating. 	<p>6. Drill retraction</p>  <ol style="list-style-type: none"> 1. Finally clear the hole at a cutting speed of 20 – 30 m/min and feed rate of 0.2 – 0.3 mm/rev. 2. Retract the drill to the pilot hole depth starting point at a feed rate of 3000 mm/min.

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