MITSUBISHI
MITSUBISHI MATERIALS

MITSUBISHI CARBIDE

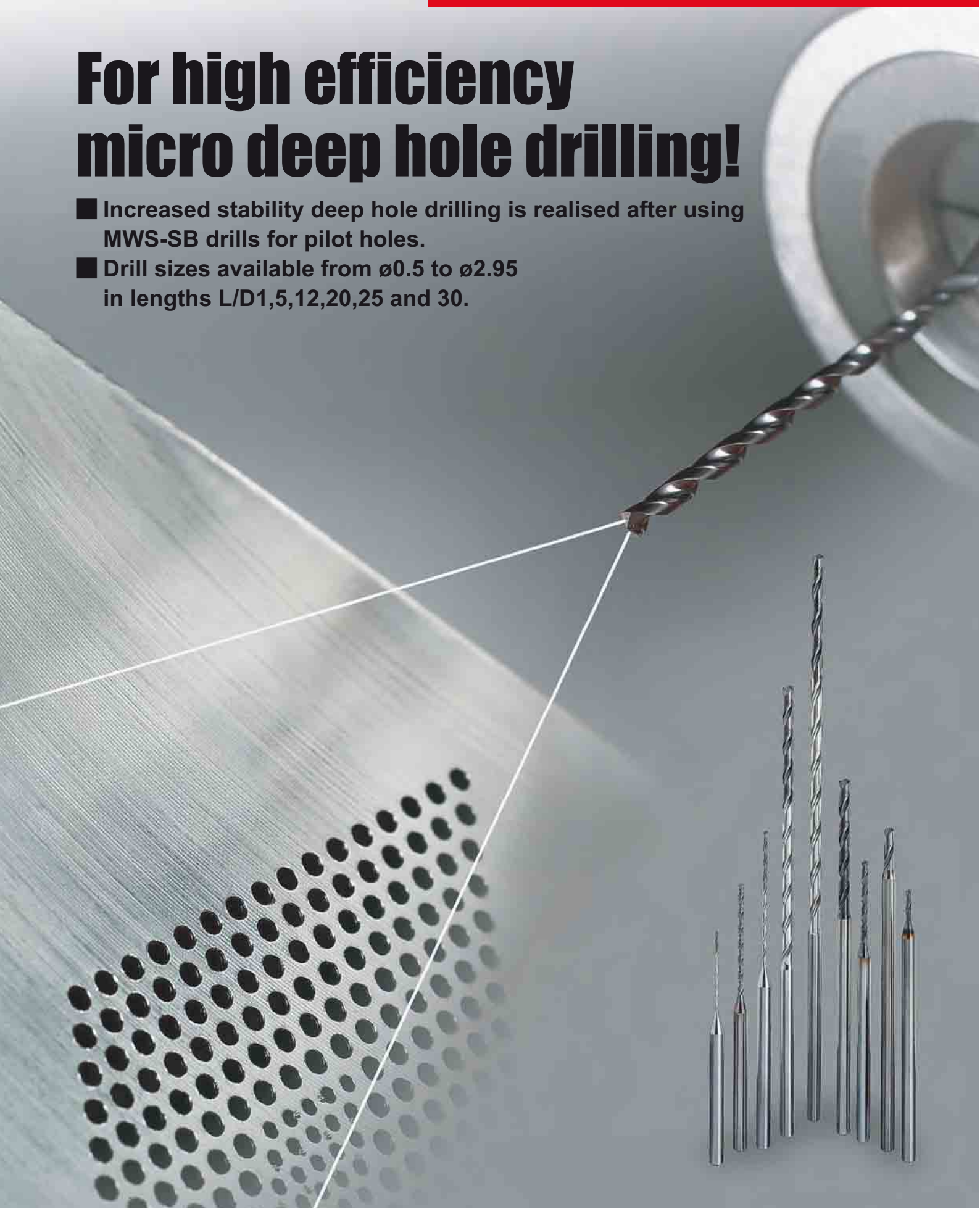
B129E

Solid Carbide Drill with Through Coolant Holes

MINI-MWS

For high efficiency micro deep hole drilling!

- Increased stability deep hole drilling is realised after using MWS-SB drills for pilot holes.
- Drill sizes available from ø0.5 to ø2.95 in lengths L/D1,5,12,20,25 and 30.

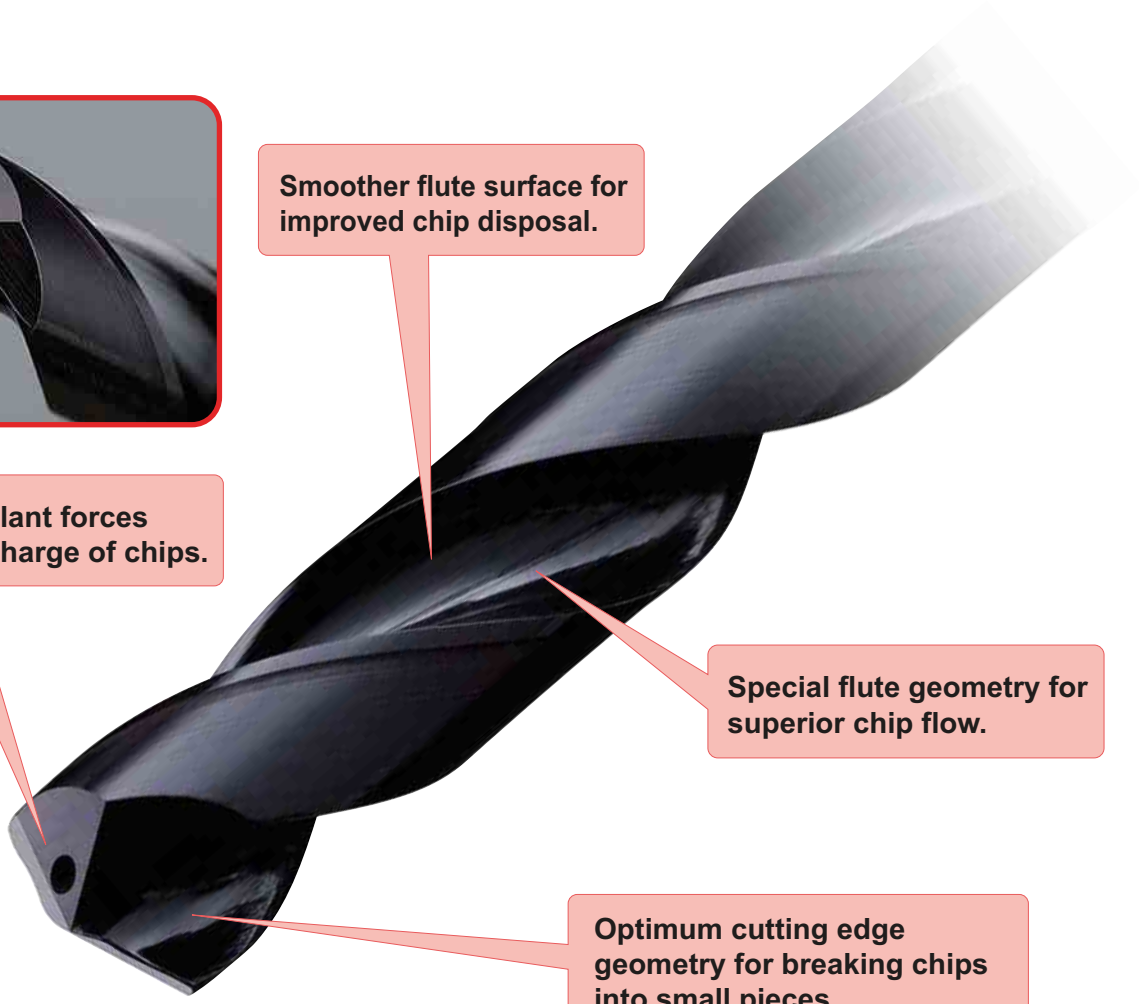


Solid Carbide Drill with Through Coolant Holes

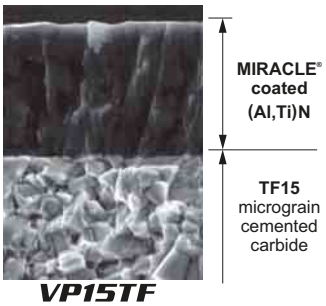
MINI-MWS

Features of MWS-LB/XB/DB Type

● **Through coolant holes, flute geometry and cutting edge geometry are optimised for deep micro hole drilling.**



● Long tool life **MIRACLE®** coated **VP15TF**



MIRACLE® Coated

Features of VP15TF

MIRACLE® coated VP15TF is ideal for drilling due to its high resistance to chip welding. Suitable for machining a wide range of workpiece materials from mild and alloy steels through to stainless steel and cast iron.

Cutting Performance of Mini MWS Drills

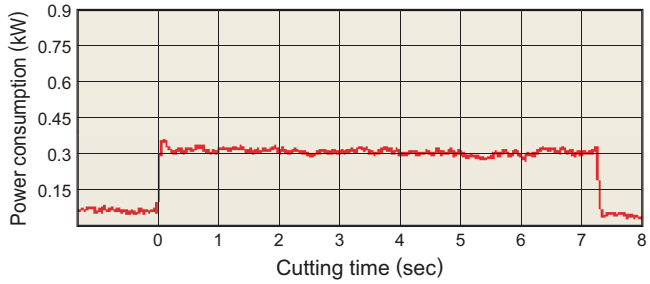
● Excellent chip disposal

Non-peck drilling is possible when drilling 75mm depth small holes!

Cutting speed: 60m/min Feed: 0.08mm/rev

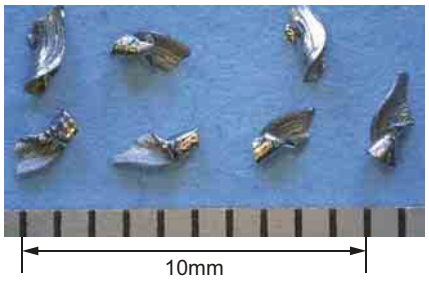
Power consumption

Stable drilling is possible with no increase in cutting forces



Chip breaking

Small broken chips

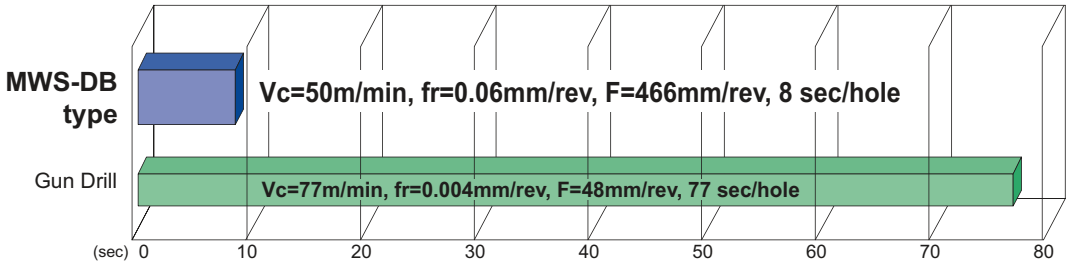


<Cutting conditions>
Workpiece : DIN 41CrMo4
Drill : MWS0255X30DB
Hole depth: 75mm
Pilot drill : MWS0255SB
Pilot hole depth: 3mm
Cutting speed : 60m/min
Feed : 0.08mm/rev
Coolant : W.S.O.
Coolant pressure : 5MPa (Internal coolant)

● Ultra productivity machining

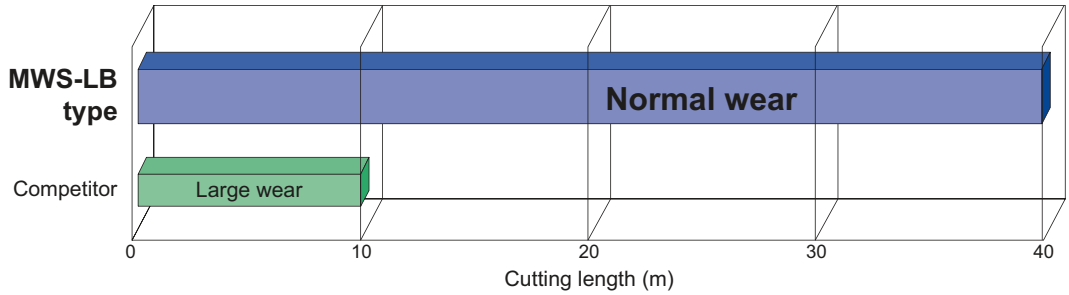
90% cycle time reduction when drilling 62mm depth small holes!

<Drilling time per hole>



<Cutting conditions>
Workpiece : DIN 41CrMo4
Drill : MWS0205X30DB
Hole depth: 62mm
Pilot drill : MWS0205SB
Pilot hole depth: 3mm
Cutting speed : 60m/min
Feed : 0.08mm/rev
Coolant : W.S.O.
Coolant pressure : 1.5MPa (Internal coolant)

● Longer tool life when drilling stainless steel

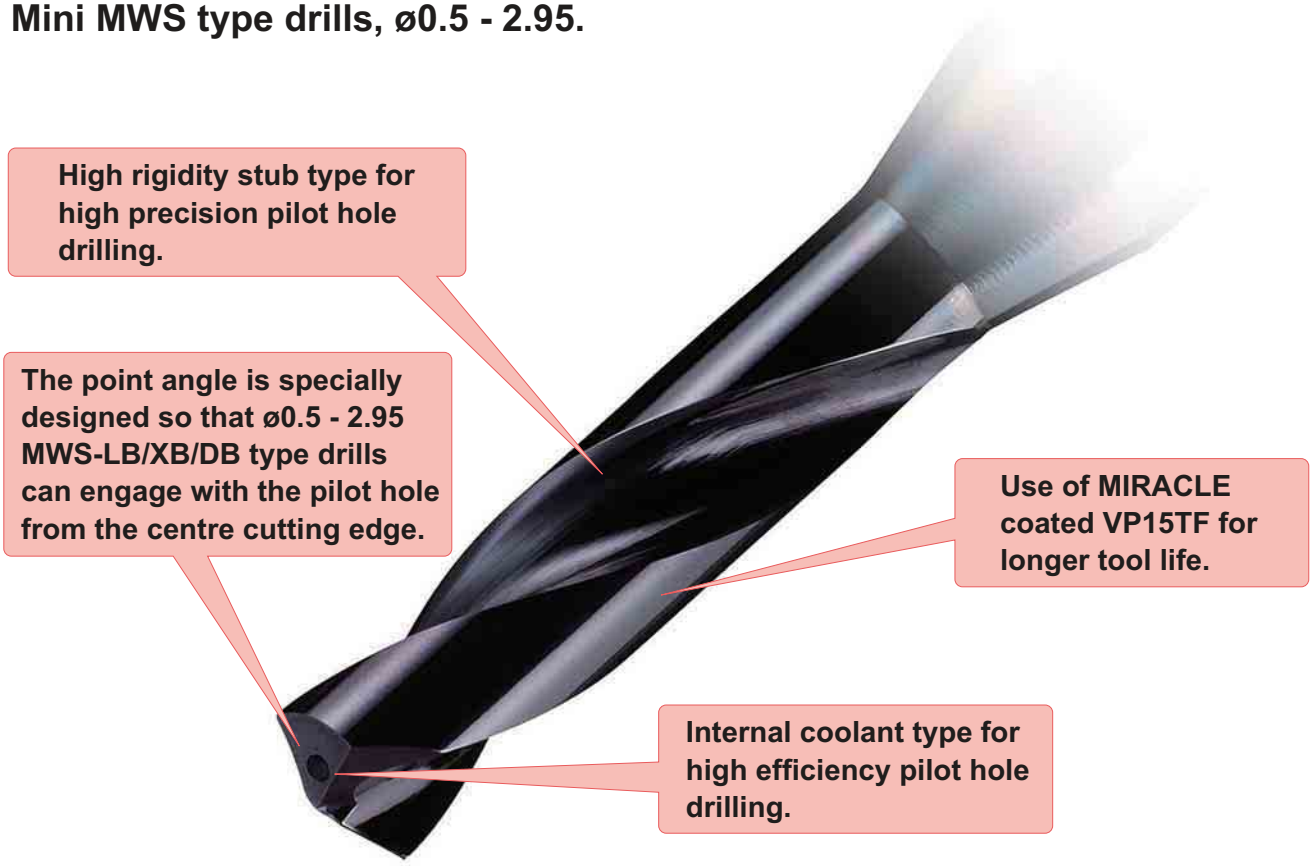


<Cutting conditions>
Workpiece : Stainless steel
Drill : MWS0250LB
Hole depth: 13mm
Cutting speed : 40m/min
Feed : 0.06mm/rev
Coolant : W.S.O.
Coolant pressure : 3MPa (Internal coolant)

MINI-MWS

Features of MWS-SB STUB Type

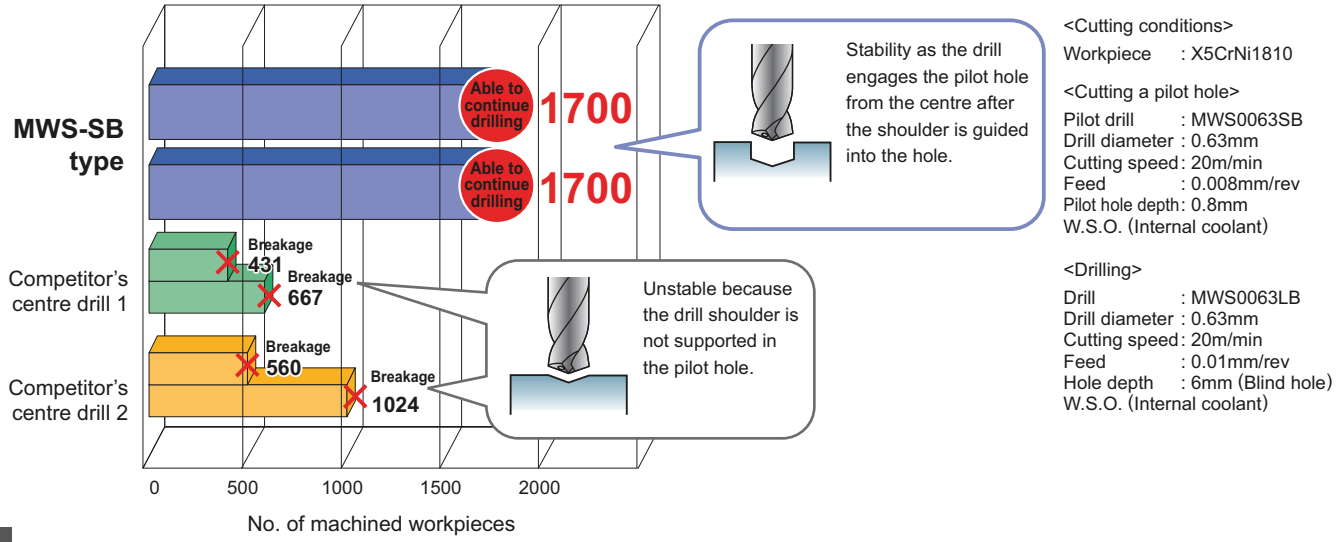
● **The MWS-SB type is a pilot drill specially designed for use with Mini MWS type drills, ø0.5 - 2.95.**



Cutting Performance of SB STUB Type

● **Drilling pilot holes with the MWS-SB type allows the long Mini-MWS type drills to deliver increased tool life.**

Micro hole drilling using the MWS-SB type drill



<Cutting conditions>
Workpiece : X5CrNi1810

<Cutting a pilot hole>
Pilot drill : MWS0063SB
Drill diameter : 0.63mm
Cutting speed : 20m/min
Feed : 0.008mm/rev
Pilot hole depth : 0.8mm
W.S.O. (Internal coolant)

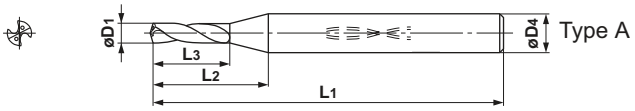
<Drilling>
Drill : MWS0063LB
Drill diameter : 0.63mm
Cutting speed : 20m/min
Feed : 0.01mm/rev
Hole depth : 6mm (Blind hole)
W.S.O. (Internal coolant)

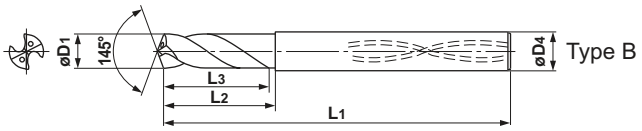
MINI-MWS

MWS (Internal coolant)

SB Type (For pilot holes)

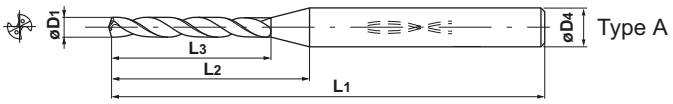
D1	0.5≤D1<1.0	1.0≤D1<2.95
Tolerance	+0.009 0	+0.014 0

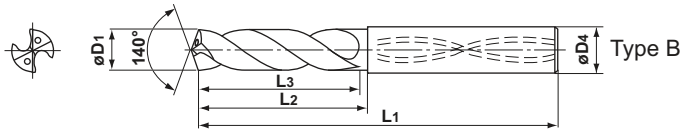




LB/XB Type

D1	0.5≤D1<1.0	1.0≤D1<2.95
Tolerance	0 -0.009	0 -0.014





(Note) MWS type can be used for shrink fit holders.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L3	L2	L1	D4	Type
0.50	1	Int.	●	MWS0050SB	2.5	7.2	47	3	A
	5	Int.	★	MWS0050LB	8	13	47	3	A
	12	Int.	★	MWS0050XB	16	21	47	3	A
0.51	1	Int.	□	MWS0051SB	2.6	7.2	47	3	A
	5	Int.	★	MWS0051LB	8	13	47	3	A
	12	Int.	★	MWS0051XB	16	21	47	3	A
0.52	1	Int.	□	MWS0052SB	2.6	7.2	47	3	A
	5	Int.	★	MWS0052LB	8	13	47	3	A
	12	Int.	★	MWS0052XB	16	21	47	3	A
0.53	1	Int.	□	MWS0053SB	2.6	7.2	47	3	A
	5	Int.	★	MWS0053LB	8	13	47	3	A
	12	Int.	★	MWS0053XB	16	21	47	3	A
0.54	1	Int.	□	MWS0054SB	2.6	7.2	47	3	A
	5	Int.	★	MWS0054LB	8	13	47	3	A
	12	Int.	★	MWS0054XB	16	21	47	3	A
0.55	1	Int.	●	MWS0055SB	2.6	7.2	47	3	A
	5	Int.	★	MWS0055LB	8	13	47	3	A
	12	Int.	★	MWS0055XB	16	21	47	3	A
0.56	1	Int.	□	MWS0056SB	2.9	7.5	47	3	A
	5	Int.	★	MWS0056LB	8	13	47	3	A
	12	Int.	★	MWS0056XB	16	21	47	3	A
0.57	1	Int.	□	MWS0057SB	2.9	7.4	47	3	A
	5	Int.	★	MWS0057LB	8	13	47	3	A
	12	Int.	★	MWS0057XB	16	21	47	3	A
0.58	1	Int.	□	MWS0058SB	2.9	7.4	47	3	A
	5	Int.	★	MWS0058LB	8	13	47	3	A
	12	Int.	★	MWS0058XB	16	21	47	3	A
0.59	1	Int.	□	MWS0059SB	2.9	7.4	47	3	A
	5	Int.	★	MWS0059LB	8	12	47	3	A
	12	Int.	★	MWS0059XB	16	20	47	3	A

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L3	L2	L1	D4	Type
0.60	1	Int.	●	MWS0060SB	2.9	7.4	47	3	A
	5	Int.	★	MWS0060LB	8	12	47	3	A
	12	Int.	★	MWS0060XB	16	20	47	3	A
0.61	1	Int.	□	MWS0061SB	3.1	7.6	47	3	A
	5	Int.	★	MWS0061LB	8	12	47	3	A
	12	Int.	★	MWS0061XB	16	20	47	3	A
0.62	1	Int.	□	MWS0062SB	3.1	7.5	47	3	A
	5	Int.	★	MWS0062LB	8	12	47	3	A
	12	Int.	★	MWS0062XB	16	20	47	3	A
0.63	1	Int.	□	MWS0063SB	3.1	7.5	47	3	A
	5	Int.	★	MWS0063LB	8	12	47	3	A
	12	Int.	★	MWS0063XB	16	20	47	3	A
0.64	1	Int.	□	MWS0064SB	3.1	7.5	47	3	A
	5	Int.	★	MWS0064LB	8	12	47	3	A
	12	Int.	★	MWS0064XB	16	20	47	3	A
0.65	1	Int.	●	MWS0065SB	3.1	7.5	47	3	A
	5	Int.	★	MWS0065LB	8	12	47	3	A
	12	Int.	★	MWS0065XB	16	20	47	3	A
0.66	1	Int.	□	MWS0066SB	3.4	7.8	47	3	A
	5	Int.	★	MWS0066LB	8	12	47	3	A
	12	Int.	★	MWS0066XB	16	20	47	3	A
0.67	1	Int.	□	MWS0067SB	3.4	7.7	47	3	A
	5	Int.	★	MWS0067LB	8	12	47	3	A
	12	Int.	★	MWS0067XB	16	20	47	3	A
0.68	1	Int.	□	MWS0068SB	3.4	7.7	47	3	A
	5	Int.	★	MWS0068LB	8	12	47	3	A
	12	Int.	★	MWS0068XB	16	20	47	3	A
0.69	1	Int.	□	MWS0069SB	3.4	7.7	47	3	A
	5	Int.	★	MWS0069LB	8	12	47	3	A
	12	Int.	★	MWS0069XB	16	20	47	3	A

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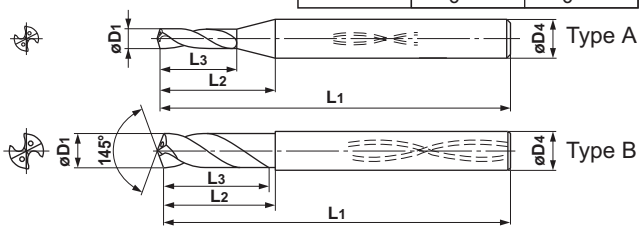
Solid Carbide Drill with Through Coolant Holes

MINI-MWS

MWS (Internal coolant)

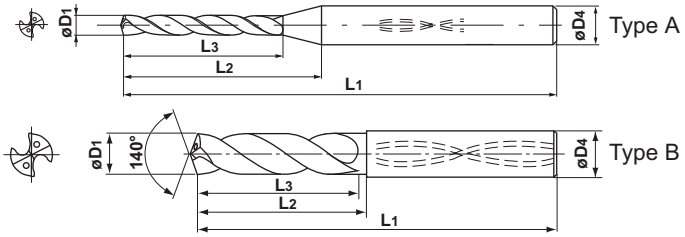
SB Type (For pilot holes)

D1	0.5≤D1<1.0	1.0≤D1<2.95
Tolerance	+0.009 0	+0.014 0



LB/XB Type

D1	0.5≤D1<1.0	1.0≤D1<2.95
Tolerance	0 -0.009	0 -0.014



DB Type

(Note) MWS type can be used for shrink fit holders.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L3	L2	L1	D4	Type
0.70	1	Int.	●	MWS0070SB	3.4	7.7	47	3	A
	5	Int.	★	MWS0070LB	8	12	47	3	A
	12	Int.	★	MWS0070XB	16	20	47	3	A
0.71	1	Int.	□	MWS0071SB	3.6	7.9	50	3	A
	5	Int.	★	MWS0071LB	10	14	50	3	A
	12	Int.	★	MWS0071XB	20	24	50	3	A
0.72	1	Int.	□	MWS0072SB	3.6	7.9	50	3	A
	5	Int.	★	MWS0072LB	10	14	50	3	A
	12	Int.	★	MWS0072XB	20	24	50	3	A
0.73	1	Int.	□	MWS0073SB	3.6	7.8	50	3	A
	5	Int.	★	MWS0073LB	10	14	50	3	A
	12	Int.	★	MWS0073XB	20	24	50	3	A
0.74	1	Int.	□	MWS0074SB	3.6	7.8	50	3	A
	5	Int.	★	MWS0074LB	10	14	50	3	A
	12	Int.	★	MWS0074XB	20	24	50	3	A
0.75	1	Int.	●	MWS0075SB	3.6	7.8	50	3	A
	5	Int.	★	MWS0075LB	10	14	50	3	A
	12	Int.	★	MWS0075XB	20	24	50	3	A
0.76	1	Int.	□	MWS0076SB	3.9	8.1	50	3	A
	5	Int.	★	MWS0076LB	10	14	50	3	A
	12	Int.	★	MWS0076XB	20	24	50	3	A
0.77	1	Int.	□	MWS0077SB	3.9	8.1	50	3	A
	5	Int.	★	MWS0077LB	10	14	50	3	A
	12	Int.	★	MWS0077XB	20	24	50	3	A
0.78	1	Int.	□	MWS0078SB	3.9	8.0	50	3	A
	5	Int.	★	MWS0078LB	10	14	50	3	A
	12	Int.	★	MWS0078XB	20	24	50	3	A
0.79	1	Int.	□	MWS0079SB	3.9	8.0	50	3	A
	5	Int.	★	MWS0079LB	10	14	50	3	A
	12	Int.	★	MWS0079XB	20	24	50	3	A

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L3	L2	L1	D4	Type
0.80	1	Int.	●	MWS0080SB	3.9	8.0	50	3	A
	5	Int.	★	MWS0080LB	10	14	50	3	A
	12	Int.	★	MWS0080XB	20	24	50	3	A
0.81	1	Int.	□	MWS0081SB	4.1	8.2	50	3	A
	5	Int.	★	MWS0081LB	10	14	50	3	A
	12	Int.	★	MWS0081XB	20	24	50	3	A
0.82	1	Int.	□	MWS0082SB	4.1	8.2	50	3	A
	5	Int.	★	MWS0082LB	10	14	50	3	A
	12	Int.	★	MWS0082XB	20	24	50	3	A
0.83	1	Int.	□	MWS0083SB	4.1	8.1	50	3	A
	5	Int.	★	MWS0083LB	10	14	50	3	A
	12	Int.	★	MWS0083XB	20	24	50	3	A
0.84	1	Int.	□	MWS0084SB	4.1	8.1	50	3	A
	5	Int.	★	MWS0084LB	10	14	50	3	A
	12	Int.	★	MWS0084XB	20	24	50	3	A
0.85	1	Int.	●	MWS0085SB	4.1	8.1	50	3	A
	5	Int.	★	MWS0085LB	10	14	50	3	A
	12	Int.	★	MWS0085XB	20	24	50	3	A
0.86	1	Int.	□	MWS0086SB	4.4	8.4	50	3	A
	5	Int.	★	MWS0086LB	10	14	50	3	A
	12	Int.	★	MWS0086XB	20	24	50	3	A
0.87	1	Int.	□	MWS0087SB	4.4	8.4	50	3	A
	5	Int.	★	MWS0087LB	10	14	50	3	A
	12	Int.	★	MWS0087XB	20	24	50	3	A
0.88	1	Int.	□	MWS0088SB	4.4	8.4	50	3	A
	5	Int.	★	MWS0088LB	10	14	50	3	A
	12	Int.	★	MWS0088XB	20	24	50	3	A
0.89	1	Int.	□	MWS0089SB	4.4	8.3	50	3	A
	5	Int.	★	MWS0089LB	10	14	50	3	A
	12	Int.	★	MWS0089XB	20	24	50	3	A

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Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L3	L2	L1	D4	Type
	1	Int.	●	**MWS0090SB**	4.4	8.3	50	3	A
0.90	5	Int.	★	**MWS0090LB**	10	14	50	3	A
	12	Int.	★	**MWS0090XB**	20	24	50	3	A
	1	Int.	□	**MWS0091SB**	4.6	8.5	50	3	A
0.91	5	Int.	★	**MWS0091LB**	10	14	50	3	A
	12	Int.	★	**MWS0091XB**	20	24	50	3	A
	1	Int.	□	**MWS0092SB**	4.6	8.5	50	3	A
0.92	5	Int.	★	**MWS0092LB**	10	14	50	3	A
	12	Int.	★	**MWS0092XB**	20	24	50	3	A
	1	Int.	□	**MWS0093SB**	4.6	8.5	50	3	A
0.93	5	Int.	★	**MWS0093LB**	10	14	50	3	A
	12	Int.	★	**MWS0093XB**	20	24	50	3	A
	1	Int.	□	**MWS0094SB**	4.6	8.4	50	3	A
0.94	5	Int.	★	**MWS0094LB**	10	14	50	3	A
	12	Int.	★	**MWS0094XB**	20	24	50	3	A
	1	Int.	●	**MWS0095SB**	4.6	8.4	50	3	A
0.95	5	Int.	★	**MWS0095LB**	10	14	50	3	A
	12	Int.	★	**MWS0095XB**	20	24	50	3	A
	1	Int.	□	**MWS0096SB**	4.9	8.7	50	3	A
0.96	5	Int.	★	**MWS0096LB**	10	14	50	3	A
	12	Int.	★	**MWS0096XB**	20	24	50	3	A
	1	Int.	□	**MWS0097SB**	4.9	8.7	50	3	A
0.97	5	Int.	★	**MWS0097LB**	10	14	50	3	A
	12	Int.	★	**MWS0097XB**	20	24	50	3	A
	1	Int.	□	**MWS0098SB**	4.9	8.7	50	3	A
0.98	5	Int.	★	**MWS0098LB**	10	14	50	3	A
	12	Int.	★	**MWS0098XB**	20	24	50	3	A
	1	Int.	□	**MWS0099SB**	4.9	8.7	50	3	A
0.99	5	Int.	★	**MWS0099LB**	10	14	50	3	A
	12	Int.	★	**MWS0099XB**	20	24	50	3	A
	1	Int.	●	**MWS0100SB**	5.0	8.7	55	3	A
	5	Int.	●	**MWS0100LB**	11	15	55	3	A
1.00	12	Int.	●	**MWS0100XB**	23	27	55	3	A
NEW	20	Int.	●	**MWS0100X20DB**	24	28	60	3	A
NEW	25	Int.	●	**MWS0100X25DB**	28	32	66	3	A
NEW	30	Int.	●	**MWS0100X30DB**	33	37	72	3	A
1.05	1	Int.	●	**MWS0105SB**	5.2	8.8	68	3	A
NEW	20	Int.	●	**MWS0105X20DB**	24	28	60	3	A
NEW	25	Int.	●	**MWS0105X25DB**	29	33	66	3	A
NEW	30	Int.	●	**MWS0105X30DB**	35	38	72	3	A
	1	Int.	●	**MWS0110SB**	5.4	8.9	55	3	A
	5	Int.	●	**MWS0110LB**	17	21	55	3	A
1.10	12	Int.	●	**MWS0110XB**	23	27	55	3	A
NEW	20	Int.	●	**MWS0110X20DB**	25	29	60	3	A
NEW	25	Int.	●	**MWS0110X25DB**	31	34	66	3	A
NEW	30	Int.	●	**MWS0110X30DB**	36	40	72	3	A
1.15	1	Int.	●	**MWS0115SB**	5.6	9.1	55	3	A
NEW	20	Int.	□	**MWS0115X20DB**	26	30	60	3	A
NEW	25	Int.	□	**MWS0115X25DB**	32	36	66	3	A
NEW	30	Int.	□	**MWS0115X30DB**	38	41	72	3	A
	1	Int.	●	**MWS0120SB**	6.0	9.4	55	3	A
	5	Int.	●	**MWS0120LB**	17	20	55	3	A
1.20	12	Int.	●	**MWS0120XB**	23	26	55	3	A
NEW	20	Int.	●	**MWS0120X20DB**	28	31	60	3	A
NEW	25	Int.	●	**MWS0120X25DB**	34	37	66	3	A
NEW	30	Int.	●	**MWS0120X30DB**	40	43	72	3	A
1.25	1	Int.	●	**MWS0125SB**	6.2	9.5	55	3	A
NEW	20	Int.	□	**MWS0125X20DB**	29	32	68	3	A
NEW	25	Int.	□	**MWS0125X25DB**	35	38	74	3	A
NEW	30	Int.	□	**MWS0125X30DB**	41	45	82	3	A
	1	Int.	●	**MWS0130SB**	6.4	9.6	55	3	A
	5	Int.	●	**MWS0130LB**	17	20	55	3	A
1.30	12	Int.	●	**MWS0130XB**	23	26	55	3	A
NEW	20	Int.	●	**MWS0130X20DB**	30	33	68	3	A
NEW	25	Int.	●	**MWS0130X25DB**	36	40	74	3	A
NEW	30	Int.	●	**MWS0130X30DB**	43	46	82	3	A

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L3	L2	L1	D4	Type
1.35	1	Int.	●	**MWS0135SB**	6.6	9.7	55	3	A
NEW	20	Int.	□	**MWS0135X20DB**	31	34	68	3	A
NEW	25	Int.	□	**MWS0135X25DB**	38	41	74	3	A
NEW	30	Int.	□	**MWS0135X30DB**	45	48	82	3	A
	1	Int.	●	**MWS0140SB**	7.0	10.0	55	3	A
	5	Int.	●	**MWS0140LB**	17	20	55	3	A
1.40	12	Int.	●	**MWS0140XB**	23	26	55	3	A
NEW	20	Int.	●	**MWS0140X20DB**	32	35	68	3	A
NEW	25	Int.	●	**MWS0140X25DB**	39	42	74	3	A
NEW	30	Int.	●	**MWS0140X30DB**	46	49	82	3	A
1.45	1	Int.	●	**MWS0145SB**	7.2	10.1	55	3	A
NEW	20	Int.	□	**MWS0145X20DB**	33	36	68	3	A
NEW	25	Int.	□	**MWS0145X25DB**	41	43	74	3	A
NEW	30	Int.	□	**MWS0145X30DB**	48	51	82	3	A
	1	Int.	●	**MWS0150SB**	7.4	10.2	55	3	A
	5	Int.	●	**MWS0150LB**	17	20	55	3	A
1.50	12	Int.	●	**MWS0150XB**	23	26	55	3	A
NEW	20	Int.	●	**MWS0150X20DB**	35	37	68	3	A
NEW	25	Int.	●	**MWS0150X25DB**	42	45	74	3	A
NEW	30	Int.	●	**MWS0150X30DB**	50	52	82	3	A
1.55	1	Int.	●	**MWS0155SB**	7.6	10.3	68	3	A
NEW	20	Int.	□	**MWS0155X20DB**	36	38	78	3	A
NEW	25	Int.	□	**MWS0155X25DB**	43	46	86	3	A
NEW	30	Int.	□	**MWS0155X30DB**	51	54	95	3	A
	1	Int.	●	**MWS0160SB**	8.0	10.6	68	3	A
	5	Int.	●	**MWS0160LB**	22	25	68	3	A
1.60	12	Int.	●	**MWS0160XB**	30	33	68	3	A
NEW	20	Int.	●	**MWS0160X20DB**	37	39	78	3	A
NEW	25	Int.	●	**MWS0160X25DB**	45	47	86	3	A
NEW	30	Int.	●	**MWS0160X30DB**	53	55	95	3	A
1.65	1	Int.	●	**MWS0165SB**	8.2	10.7	68	3	A
NEW	20	Int.	□	**MWS0165X20DB**	38	40	78	3	A
NEW	25	Int.	□	**MWS0165X25DB**	46	49	86	3	A
NEW	30	Int.	□	**MWS0165X30DB**	54	57	95	3	A
	1	Int.	●	**MWS0170SB**	8.4	10.8	68	3	A
	5	Int.	●	**MWS0170LB**	22	24	68	3	A
1.70	12	Int.	●	**MWS0170XB**	30	32	68	3	A
NEW	20	Int.	●	**MWS0170X20DB**	39	42	78	3	A
NEW	25	Int.	●	**MWS0170X25DB**	48	50	86	3	A
NEW	30	Int.	●	**MWS0170X30DB**	56	59	95	3	A
1.75	1	Int.	●	**MWS0175SB**	8.6	10.9	68	3	A
NEW	20	Int.	□	**MWS0175X20DB**	40	43	84	3	A
NEW	25	Int.	□	**MWS0175X25DB**	49	51	94	3	A
NEW	30	Int.	□	**MWS0175X30DB**	58	60	102	3	A
	1	Int.	●	**MWS0180SB**	9.0	11.2	68	3	A
	5	Int.	●	**MWS0180LB**	22	24	68	3	A
1.80	12	Int.	●	**MWS0180XB**	30	32	68	3	A
NEW	20	Int.	●	**MWS0180X20DB**	41	44	84	3	A
NEW	25	Int.	●	**MWS0180X25DB**	50	53	94	3	A
NEW	30	Int.	●	**MWS0180X30DB**	59	62	102	3	A
1.85	1	Int.	●	**MWS0185SB**	9.2	11.3	68	3	A
NEW	20	Int.	□	**MWS0185X20DB**	43	45	84	3	A
NEW	25	Int.	□	**MWS0185X25DB**	52	54	94	3	A
NEW	30	Int.	□	**MWS0185X30DB**	61	63	102	3	A
	1	Int.	●	**MWS0190SB**	9.4	11.5	68	3	A
	5	Int.	●	**MWS0190LB**	22	24	68	3	A
1.90	12	Int.	●	**MWS0190XB**	30	32	68	3	A
NEW	20	Int.	●	**MWS0190X20DB**	44	46	84	3	A
NEW	25	Int.	●	**MWS0190X25DB**	53	55	94	3	A
NEW	30	Int.	●	**MWS0190X30DB**	63	65	102	3	A
1.95	1	Int.	●	**MWS0195SB**	9.6	11.6	68	3	A
NEW	20	Int.	□	**MWS0195X20DB**	45	47	84	3	A
NEW	25	Int.	□	**MWS0195X25DB**	55	57	94	3	A
NEW	30	Int.	□	**MWS0195X30DB**	64	66	102	3	A

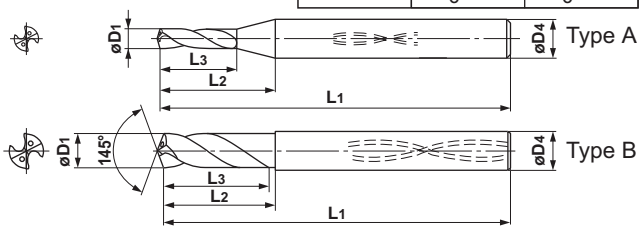
Solid Carbide Drill with Through Coolant Holes

MINI-MWS

MWS (Internal coolant)

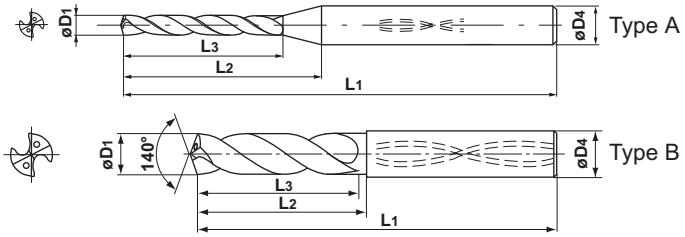
SB Type (For pilot holes)

D1	0.5≤D1<1.0	1.0≤D1<2.95
Tolerance	+0.009 0	+0.014 0



LB/XB Type

D1	0.5≤D1<1.0	1.0≤D1<2.95
Tolerance	0 -0.009	0 -0.014



DB Type

(Note) MWS type can be used for shrink fit holders.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L3	L2	L1	D4	Type
2.00	1	Int.	●	MWS0200SB	10.0	11.9	68	3	A
	5	Int.	●	MWS0200LB	22	24	68	3	A
	12	Int.	●	MWS0200XB	30	32	68	3	A
NEW	20	Int.	●	MWS0200X20DB	46	48	84	3	A
NEW	25	Int.	●	MWS0200X25DB	56	58	94	3	A
NEW	30	Int.	●	MWS0200X30DB	66	68	102	3	A
2.05	1	Int.	●	MWS0205SB	10.2	12.0	74	3	A
NEW	20	Int.	●	MWS0205X20DB	47	49	94	3	A
NEW	25	Int.	●	MWS0205X25DB	57	59	107	3	A
NEW	30	Int.	●	MWS0205X30DB	68	69	118	3	A
2.10	1	Int.	●	MWS0210SB	10.4	12.1	74	3	A
	5	Int.	●	MWS0210LB	28	30	74	3	A
	12	Int.	●	MWS0210XB	38	40	74	3	A
NEW	20	Int.	●	MWS0210X20DB	48	50	94	3	A
NEW	25	Int.	●	MWS0210X25DB	59	60	107	3	A
NEW	30	Int.	●	MWS0210X30DB	69	71	118	3	A
2.15	1	Int.	●	MWS0215SB	10.6	12.2	74	3	A
NEW	20	Int.	□	MWS0215X20DB	49	51	94	3	A
NEW	25	Int.	□	MWS0215X25DB	60	62	107	3	A
NEW	30	Int.	□	MWS0215X30DB	71	73	118	3	A
2.20	1	Int.	●	MWS0220SB	11.0	12.5	74	3	A
	5	Int.	●	MWS0220LB	28	29	74	3	A
	12	Int.	●	MWS0220XB	38	39	74	3	A
NEW	20	Int.	●	MWS0220X20DB	51	52	94	3	A
NEW	25	Int.	●	MWS0220X25DB	62	63	107	3	A
NEW	30	Int.	●	MWS0220X30DB	73	74	118	3	A
2.25	1	Int.	●	MWS0225SB	11.2	12.6	74	3	A
NEW	20	Int.	□	MWS0225X20DB	52	53	94	3	A
NEW	25	Int.	□	MWS0225X25DB	63	64	107	3	A
NEW	30	Int.	□	MWS0225X30DB	74	76	118	3	A

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L3	L2	L1	D4	Type
2.30	1	Int.	●	MWS0230SB	11.4	12.7	74	3	A
	5	Int.	●	MWS0230LB	28	29	74	3	A
	12	Int.	●	MWS0230XB	38	39	74	3	A
NEW	20	Int.	●	MWS0230X20DB	53	54	94	3	A
NEW	25	Int.	●	MWS0230X25DB	64	66	107	3	A
NEW	30	Int.	●	MWS0230X30DB	76	77	118	3	A
2.35	1	Int.	●	MWS0235SB	11.6	12.8	74	3	A
NEW	20	Int.	□	MWS0235X20DB	54	55	94	3	A
NEW	25	Int.	□	MWS0235X25DB	66	67	107	3	A
NEW	30	Int.	□	MWS0235X30DB	78	79	118	3	A
2.40	1	Int.	●	MWS0240SB	12.0	13.1	74	3	A
	5	Int.	●	MWS0240LB	28	29	74	3	A
	12	Int.	●	MWS0240XB	38	39	74	3	A
NEW	20	Int.	●	MWS0240X20DB	55	56	94	3	A
NEW	25	Int.	●	MWS0240X25DB	67	68	107	3	A
NEW	30	Int.	●	MWS0240X30DB	79	80	118	3	A
2.45	1	Int.	●	MWS0245SB	12	13	74	3	A
NEW	20	Int.	□	MWS0245X20DB	56	57	94	3	A
NEW	25	Int.	□	MWS0245X25DB	69	70	107	3	A
NEW	30	Int.	□	MWS0245X30DB	81	82	118	3	A
2.50	1	Int.	●	MWS0250SB	12.2	13.2	74	3	A
	5	Int.	●	MWS0250LB	28	29	74	3	A
	12	Int.	●	MWS0250XB	38	39	74	3	A
NEW	20	Int.	●	MWS0250X20DB	58	59	94	3	A
NEW	25	Int.	●	MWS0250X25DB	70	71	107	3	A
NEW	30	Int.	●	MWS0250X30DB	83	84	118	3	A
2.55	1	Int.	●	MWS0255SB	12.6	12.6	81	3	B
NEW	20	Int.	●	MWS0255X20DB	59	59	103	3	B
NEW	25	Int.	●	MWS0255X25DB	71	71	117	3	B
NEW	30	Int.	●	MWS0255X30DB	84	84	132	3	B

(Note) Please contact us for any geometry that is not in this catalogue (e.g. different diameters and lengths can be made to order).

● : Inventory maintained. □ : Non stock, produced to order only.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L3	L2	L1	D4	Type
2.60	1	Int.	●	MWS0260SB	13.0	13.0	81	3	B
	5	Int.	●	MWS0260LB	33	33	81	3	B
	12	Int.	●	MWS0260XB	45	45	81	3	B
NEW	20	Int.	●	MWS0260X20DB	60	60	103	3	B
NEW	25	Int.	●	MWS0260X25DB	73	73	117	3	B
NEW	30	Int.	●	MWS0260X30DB	86	86	132	3	B
2.65	1	Int.	●	MWS0265SB	13.2	13.2	81	3	B
NEW	20	Int.	□	MWS0265X20DB	61	61	103	3	B
NEW	25	Int.	□	MWS0265X25DB	74	74	117	3	B
NEW	30	Int.	□	MWS0265X30DB	87	87	132	3	B
2.70	1	Int.	●	MWS0270SB	13.4	13.4	81	3	B
	5	Int.	●	MWS0270LB	33	33	81	3	B
	12	Int.	●	MWS0270XB	45	45	81	3	B
NEW	20	Int.	●	MWS0270X20DB	62	62	103	3	B
NEW	25	Int.	●	MWS0270X25DB	76	76	117	3	B
NEW	30	Int.	●	MWS0270X30DB	89	89	132	3	B
2.75	1	Int.	●	MWS0275SB	13.6	13.6	81	3	B
NEW	20	Int.	□	MWS0275X20DB	63	63	103	3	B
NEW	25	Int.	□	MWS0275X25DB	77	77	117	3	B
NEW	30	Int.	□	MWS0275X30DB	91	91	132	3	B

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L3	L2	L1	D4	Type
2.80	1	Int.	●	MWS0280SB	14.0	14.0	81	3	B
	5	Int.	●	MWS0280LB	33	33	81	3	B
	12	Int.	●	MWS0280XB	45	45	81	3	B
NEW	20	Int.	●	MWS0280X20DB	64	64	103	3	B
NEW	25	Int.	●	MWS0280X25DB	78	78	117	3	B
NEW	30	Int.	●	MWS0280X30DB	92	92	132	3	B
2.85	1	Int.	●	MWS0285SB	14.2	14.2	81	3	B
NEW	20	Int.	□	MWS0285X20DB	66	66	103	3	B
NEW	25	Int.	□	MWS0285X25DB	80	80	117	3	B
NEW	30	Int.	□	MWS0285X30DB	94	94	132	3	B
2.90	1	Int.	●	MWS0290SB	14.4	14.4	81	3	B
	5	Int.	●	MWS0290LB	33	33	81	3	B
	12	Int.	●	MWS0290XB	45	45	81	3	B
NEW	20	Int.	●	MWS0290X20DB	67	67	103	3	B
NEW	25	Int.	●	MWS0290X25DB	81	81	117	3	B
NEW	30	Int.	●	MWS0290X30DB	96	96	132	3	B
2.95	1	Int.	●	MWS0295SB	14.6	14.6	81	3	B
NEW	20	Int.	□	MWS0295X20DB	68	68	103	3	B
NEW	25	Int.	□	MWS0295X25DB	83	83	117	3	B
NEW	30	Int.	●	MWS0295X30DB	97	97	132	3	B

Recommended Cutting Conditions

SB/LB/XB Type Drill

Work Material		Drill Diameter / Conditions / Hardness	ϕ0.50—ϕ0.70 Cutting Speed (m/min)	ϕ0.50—ϕ0.70 Feed (mm/rev)	ϕ0.71—ϕ0.85 Cutting Speed (m/min)	ϕ0.71—ϕ0.85 Feed (mm/rev)	ϕ0.86—ϕ0.99 Cutting Speed (m/min)	ϕ0.86—ϕ0.99 Feed (mm/rev)	ϕ1.0—ϕ2.95 Cutting Speed (m/min)	ϕ1.0—ϕ2.95 Feed (mm/rev)
P	Mild Steel	≤180HB	50 (40—60)	0.010 (0.005—0.015)	50 (40—60)	0.02 (0.01—0.03)	50 (40—60)	0.03 (0.02—0.05)	50 (40—60)	0.08 (0.04—0.12)
P	Carbon Steel Alloy Steel	180—280HB	50 (40—60)	0.010 (0.005—0.015)	50 (40—60)	0.02 (0.01—0.03)	50 (40—60)	0.03 (0.02—0.05)	50 (40—60)	0.08 (0.04—0.12)
P	Carbon Steel Alloy Steel	280—350HB	50 (40—60)	0.010 (0.005—0.015)	50 (40—60)	0.02 (0.01—0.03)	50 (40—60)	0.03 (0.02—0.05)	50 (40—60)	0.08 (0.04—0.12)
M	Stainless Steel	≤200HB	30 (20—40)	0.008 (0.005—0.01)	30 (20—40)	0.015 (0.008—0.02)	30 (20—40)	0.02 (0.01—0.03)	30 (20—40)	0.05 (0.02—0.10)
K	Cast Iron	Tensile Strength ≤350MPa	50 (40—60)	0.015 (0.008—0.02)	50 (40—60)	0.02 (0.01—0.03)	50 (40—60)	0.04 (0.02—0.06)	50 (40—60)	0.08 (0.04—0.12)
K	Ductile Cast Iron	Tensile Strength ≤450MPa	30 (20—40)	0.010 (0.005—0.015)	30 (20—40)	0.02 (0.01—0.03)	30 (20—40)	0.03 (0.02—0.05)	30 (20—40)	0.06 (0.02—0.10)
N	Aluminium Alloy	—	60 (50—80)	0.03 (0.02—0.05)	60 (50—80)	0.04 (0.03—0.06)	60 (50—80)	0.06 (0.04—0.08)	60 (50—80)	0.10 (0.05—0.15)
S	Heat Resistant Alloy	—	10 (5—15)	0.006 (0.004—0.008)	10 (5—15)	0.01 (0.005—0.02)	10 (5—15)	0.01 (0.005—0.02)	10 (5—15)	0.03 (0.01—0.05)

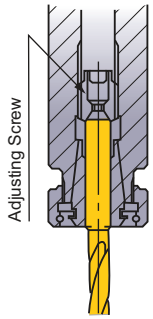
DB Type Long Drill

Work Material		Drill Diameter / Conditions / Hardness	ϕ1.0—ϕ2.0 Cutting Speed (m/min)	ϕ1.0—ϕ2.0 Feed (mm/rev)	ϕ2.05—ϕ2.95 Cutting Speed (m/min)	ϕ2.05—ϕ2.95 Feed (mm/rev)
P	Mild Steel	≤180HB	50 (40—60)	0.08 (0.04—0.10)	60 (50—70)	0.10 (0.08—0.12)
P	Carbon Steel Alloy Steel	180—280HB	40 (30—50)	0.07 (0.04—0.08)	50 (40—60)	0.09 (0.06—0.12)
P	Carbon Steel Alloy Steel	280—350HB	30 (20—40)	0.04 (0.03—0.06)	50 (40—60)	0.07 (0.05—0.10)
M	Stainless Steel	≤200HB	30 (20—40)	0.03 (0.01—0.05)	30 (20—40)	0.06 (0.04—0.08)
K	Cast Iron	Tensile Strength ≤350MPa	40 (30—50)	0.07 (0.04—0.08)	50 (40—60)	0.09 (0.06—0.12)
K	Ductile Cast Iron	Tensile Strength ≤450MPa	30 (20—40)	0.04 (0.03—0.06)	50 (40—60)	0.07 (0.05—0.10)
S	Heat Resistant Alloy	—	10 (5—15)	0.02 (0.01—0.03)	15 (10—20)	0.03 (0.01—0.05)

MINI-MWS

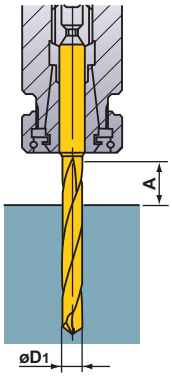
Operational Guidance

Drill Holding



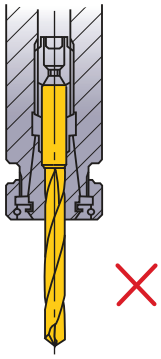
Thrust bearing type collet chuck holds the drill securely.

Drill Length



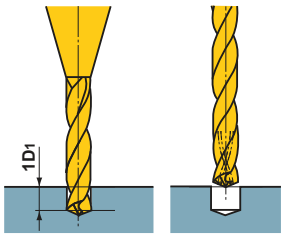
A ≥ D1 x 2

Drill Installation



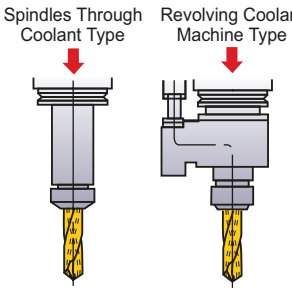
Do not clamp on the flutes.

Drill Installation



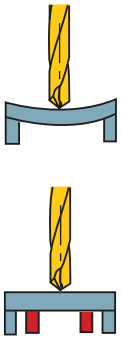
①When machining a prepared hole with the stub type drill please set the depth to 1D (D=drill diameter).
②Use the prepared hole as a guide when using a drill with an oil hole. Depending on the cutting conditions, peck feed is recommended.

Through Coolant Type



Recommended coolant pressure:
≥ 3Mpa
At least 1.5Mpa is required.

Thin Workpiece



If Bending Occurs ×

Support the Workpiece ○

Coolant Handling

1) Small particles of swarf will jam in the oil hole of small diameter drills. Always use a fine mesh filter as a preventative measure.

2) Dirt and dust particles adhere to the oil in old coolant and prevent an efficient flow. Regular coolant exchange is recommended.

CAUTION WHEN USING MWS TYPE (Drill Diameter ≤ ϕ3)

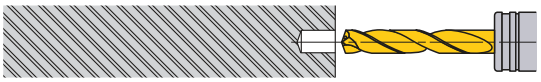
- Please use a fine mesh filter (mesh≤3μm) for coolant to prevent jamming in the oil hole.
- For deep drilling with the MWS-DB long drill, machining a pilot hole is recommended. (Otherwise, centrifugal forces may cause drill breakage.)

Operational Guidance for the MWS-DB Type Long Drill

Flat Face Drilling

●Drilling a blind hole

1. Drilling a pilot hole



①Use a drill with a larger (flatter) point angle than the long type. The MWS-SB type is recommended.
②Ensure a high precision hole is drilled for the guide.
③Drill depth : Approx 1D.

2. Initial cutting with the long type drill

①Penetrate the pilot hole at a low revolution. (Cutting speed 20—30m/min, feed rate 0.2—0.3mm/rev)
②Stop the long type drill 0.5—1.0mm short of the pilot hole bottom.

3. Drill the deep hole

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

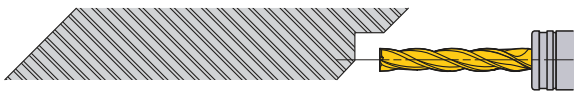
4. Drill retraction

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

Interruped Drilling

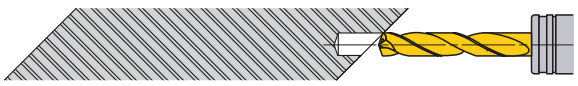
●Drilling and breaking through on irregular faces or angles

1. Spot facing



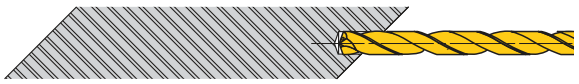
①Machine a flat on the irregular face by using an end mill or slot drill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

2. Drilling a pilot hole



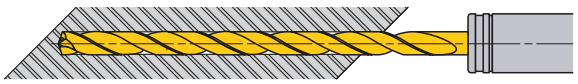
①Use a drill with a larger (flatter) point angle than the long type. The MWS-SB type is recommended.
②Ensure a high precision hole is drilled for the guide.
③Drill depth : Approx 1D.

3. Initial cutting with the long type drill



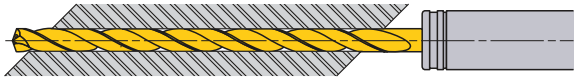
①Penetrate the pilot hole at a low revolution. (Cutting speed 20—30m/min, feed rate 0.2—0.3mm/rev)
②Stop the long type drill 1—3mm short of the pilot hole bottom.

4. Drill the deep hole



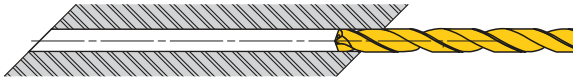
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

5. Breaking through



①When breaking through, the cutting edge can be damaged.
②Feed rate should be half the normal feed.

6. Drill retraction



①Retract the drill to the pilot hole depth starting point at a feed rate of 3000mm/min.
②Finally clear the hole at a cutting speed of 20—30m/min and feed rate of 0.2—0.3mm/rev.

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