

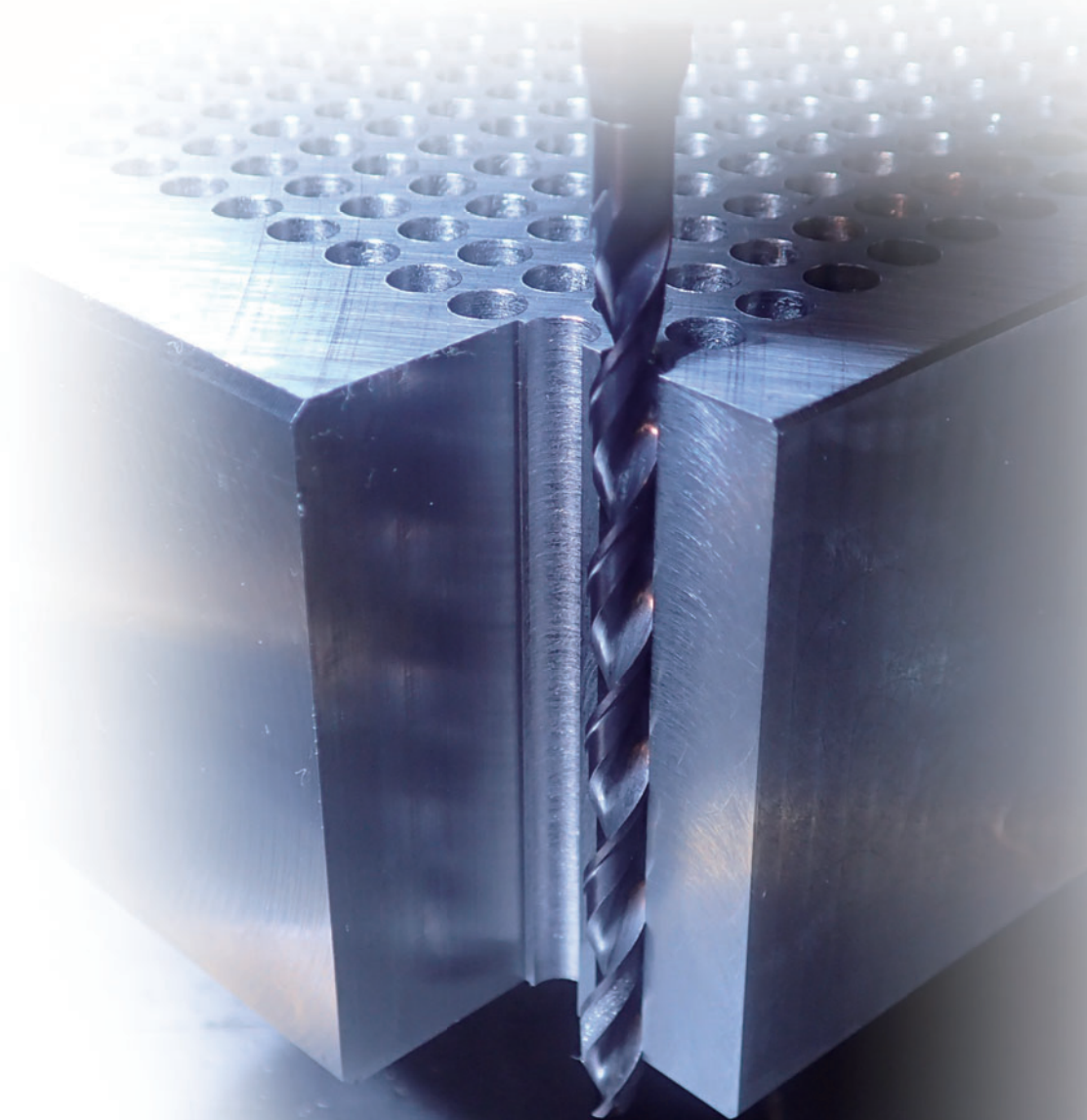
High-speed Steel Drill

Violet High Precision Drill Series

VAPDJ

New
Products

**Long-lasting drill bits for stable,
high accuracy, non-step drilling of
deep L/D=10 holes**



High-speed Steel Drill

VAPDJ

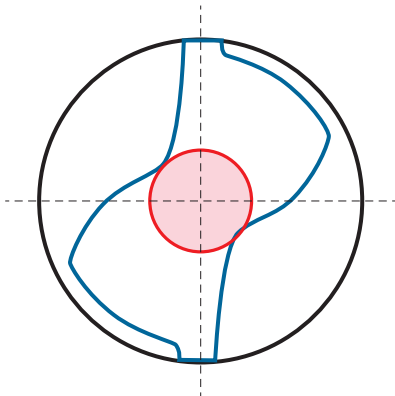
Violet High Precision Drill Series

Long-lasting drill bits for stable, high accuracy, non-step drilling of deep L/D=10 holes

Cutter Shape Ensures both Rigidity and Good Chip Ejection

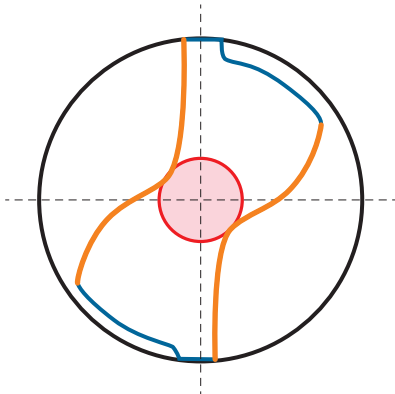
We've employed our proprietary high-rigidity cross-section shape to optimise flute thickness. Furthermore, by increasing the size of the chip pocket on the flute sweep side, we achieved both good tool rigidity and chip ejection.

Cross Section of the Flute Tip Side



Straightness and breakage resistance are improved by increasing core shaft thickness.

Cross Section of the Cutter Sweep Side



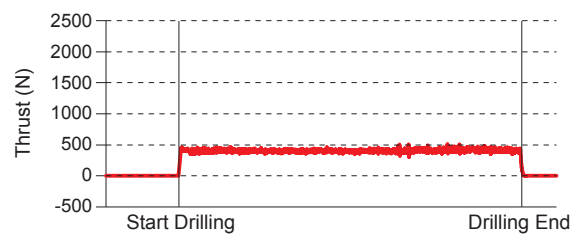
Chip ejection during deep drilling is improved by increasing the size of the chip pocket.

Flute Smoothing

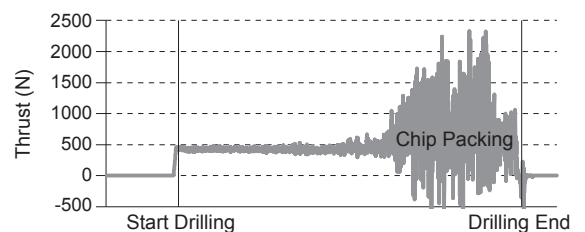
The flutes have been smoothed to improve chip ejection. This allows L/D = 10 deep holes to be bored without *stepping.

*Non-step drilling of horizontal holes by lathe or horizontal M/C is not recommended.

VAPDJ



Conventional



<Cutting Conditions>

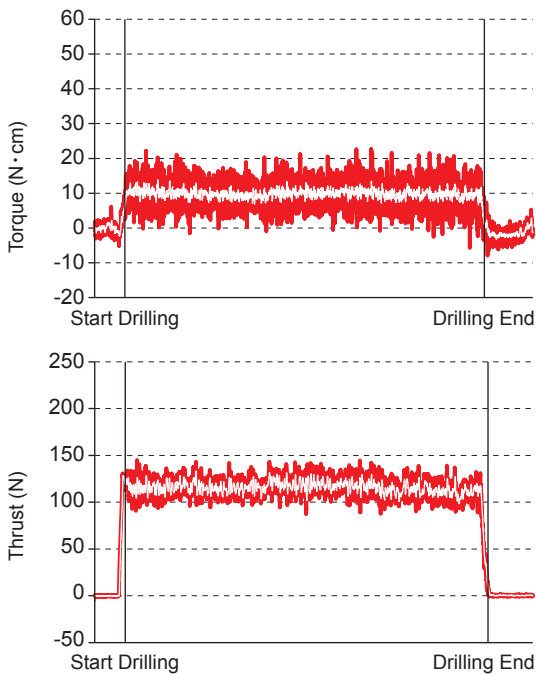
Drill : VAPJD0460
Work Material : AISI 1055
Hole Depth : 40 mm
Cutting Speed vc : 25 m/min
Feed Rate fr : 0.14 mm/rev
Cutting Mode : Through Hole Emulsion

Cutting Performance

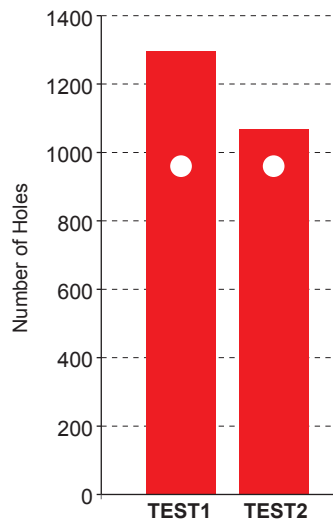
Stable Non-step Drilling of L/D = 10 Deep Holes

Stable processing and long service life have been achieved for non-step drilling of even small diameter deep holes.

Cutting Resistance



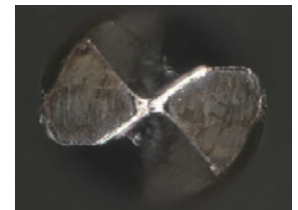
Tool Life



960 holes



TEST1



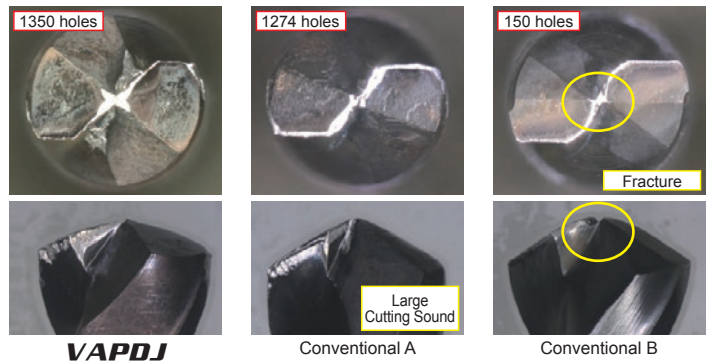
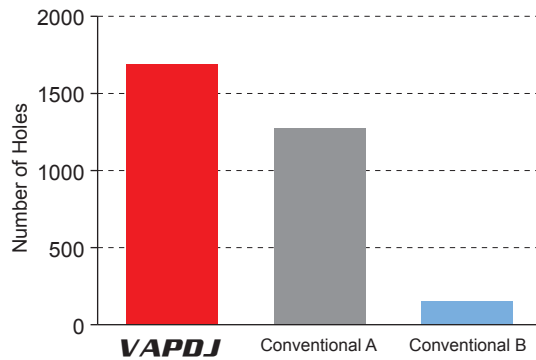
TEST2

<Cutting Conditions>

Drill : VAPDJD0200	Feed Rate f_r : 0.06 mm/rev
Work Material : AISI 1050	Cutting Mode : Blind Hole
Hole Depth : 20 mm (L/D=10)	Non-step Drilling
Cutting Speed v_c : 30 m/min	Emulsion

Tool Life Comparison

Achieves long life without defects or breaks compared to conventional bits.

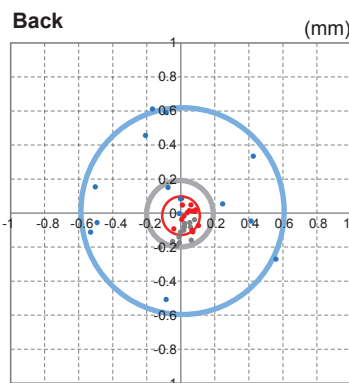
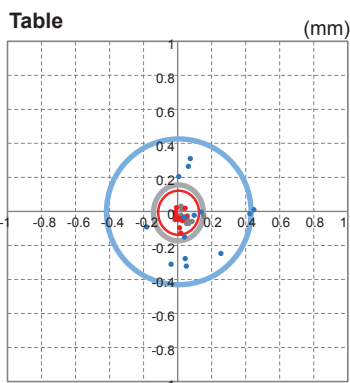


<Cutting Conditions>

Drill : VAPDJD0680	Feed Rate f_r : 0.16 mm/rev
Work Material : AISI 1055	Cutting Mode : Through Hole
Hole Depth : 50 mm	Non-step Drilling
Cutting Speed v_c : 25 m/min	Emulsion

Hole Position Accuracy Comparison (Hole Position Displacement)

Manifests good biting performance compared to conventional products, enabling high precision machining with minimal hole deformation.



<Cutting Conditions>

Drill : VAPDJD0680	Feed Rate f_r : 0.16 mm/rev
Work Material : AISI 1055	Cutting Mode : Through Hole
Hole Depth : 50 mm	Non-step Drilling
Cutting Speed v_c : 25 m/min	Emulsion
Feed Rate f_r : 0.16 mm/rev	
Cutting Mode : Through Hole	



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Semi long, High precision

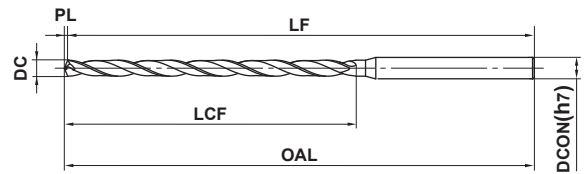


DC<2

2≤DC

P	M	K	N	S	H
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0.5≤DC≤3	3<DC≤6	6<DC≤10
⁰ _{-0.014}	⁰ _{-0.018}	⁰ _{-0.022}



- Long-lasting drill bits for stable, high accuracy, non-step drilling of deep L/D=10 holes

Order Number	DC	LCF	OAL	LF	PL	DCON	Stock
VAPDJD0100	1.0	18.3	66.3	66	0.3	3	●
VAPDJD0110	1.1	22.3	66.3	66	0.3	3	●
VAPDJD0120	1.2	22.4	66.4	66	0.4	3	●
VAPDJD0130	1.3	22.4	66.4	66	0.4	3	●
VAPDJD0140	1.4	24.4	66.4	66	0.4	3	●
VAPDJD0150	1.5	24.5	66.5	66	0.5	3	●
VAPDJD0160	1.6	30.5	71.5	71	0.5	3	●
VAPDJD0170	1.7	30.5	71.5	71	0.5	3	●
VAPDJD0180	1.8	33.5	71.5	71	0.5	3	●
VAPDJD0190	1.9	33.6	71.6	71	0.6	3	●
VAPDJD0200	2.0	36.4	81.4	81	0.4	3	●
VAPDJD0210	2.1	36.4	81.4	81	0.4	3	●
VAPDJD0220	2.2	36.5	81.5	81	0.5	3	●
VAPDJD0230	2.3	36.5	81.5	81	0.5	3	●
VAPDJD0240	2.4	39.5	81.5	81	0.5	3	●
VAPDJD0250	2.5	39.5	81.5	81	0.5	3	●
VAPDJD0260	2.6	39.5	81.5	81	0.5	3	●
VAPDJD0270	2.7	45.6	81.6	81	0.6	3	●
VAPDJD0280	2.8	45.6	81.6	81	0.6	3	●
VAPDJD0290	2.9	45.6	81.6	81	0.6	3	●
VAPDJD0300	3.0	45.6	81.6	81	0.6	3	●
VAPDJD0310	3.1	51.6	102.6	102	0.6	4	●
VAPDJD0320	3.2	51.7	102.7	102	0.7	4	●
VAPDJD0330	3.3	51.7	102.7	102	0.7	4	●
VAPDJD0340	3.4	54.7	102.7	102	0.7	4	●
VAPDJD0350	3.5	54.7	102.7	102	0.7	4	●
VAPDJD0360	3.6	57.8	102.8	102	0.8	4	●
VAPDJD0370	3.7	57.8	102.8	102	0.8	4	●
VAPDJD0380	3.8	60.8	102.8	102	0.8	4	●
VAPDJD0390	3.9	60.8	102.8	102	0.8	4	●
VAPDJD0400	4.0	60.8	102.8	102	0.8	4	●
VAPDJD0410	4.1	60.9	118.9	118	0.9	6	●
VAPDJD0420	4.2	60.9	118.9	118	0.9	6	●
VAPDJD0430	4.3	66.9	118.9	118	0.9	6	●
VAPDJD0440	4.4	66.9	118.9	118	0.9	6	●
VAPDJD0450	4.5	66.9	118.9	118	0.9	6	●
VAPDJD0460	4.6	67.0	122.0	121	1.0	6	●
VAPDJD0470	4.7	67.0	122.0	121	1.0	6	●
VAPDJD0480	4.8	73.0	122.0	121	1.0	6	●
VAPDJD0490	4.9	73.0	122.0	121	1.0	6	●
VAPDJD0500	5.0	73.0	122.0	121	1.0	6	●
VAPDJD0510	5.1	73.1	122.1	121	1.1	6	●
VAPDJD0520	5.2	73.1	122.1	121	1.1	6	●
VAPDJD0530	5.3	73.1	122.1	121	1.1	6	●
VAPDJD0540	5.4	79.1	129.1	128	1.1	6	●
VAPDJD0550	5.5	79.1	129.1	128	1.1	6	●
VAPDJD0560	5.6	79.2	129.2	128	1.2	6	●
VAPDJD0570	5.7	79.2	129.2	128	1.2	6	●
VAPDJD0580	5.8	79.2	129.2	128	1.2	6	●
VAPDJD0590	5.9	79.2	129.2	128	1.2	6	●
VAPDJD0600	6.0	79.2	129.2	128	1.2	6	●
VAPDJD0650	6.5	85.4	135.4	134	1.4	8	●
VAPDJD0680	6.8	91.4	141.4	140	1.4	8	●
VAPDJD0690	6.9	91.4	141.4	140	1.4	8	●
VAPDJD0700	7.0	91.5	141.5	140	1.5	8	●
VAPDJD0710	7.1	91.5	141.5	140	1.5	8	●
VAPDJD0750	7.5	91.6	141.6	140	1.6	8	●
VAPDJD0780	7.8	97.6	147.6	146	1.6	8	●
VAPDJD0790	7.9	97.6	147.6	146	1.6	8	●
VAPDJD0800	8.0	97.7	147.7	146	1.7	8	●
VAPDJD0850	8.5	103.8	158.8	157	1.8	10	●
VAPDJD0860	8.6	115.8	170.8	169	1.8	10	●
VAPDJD0900	9.0	115.9	170.9	169	1.9	10	●
VAPDJD0950	9.5	116.0	171.0	169	2.0	10	●
VAPDJD0960	9.6	122.0	177.0	175	2.0	10	●
VAPDJD1000	10.0	122.1	177.1	175	2.1	10	●

● : Inventory maintained in Japan.

Recommended Cutting Conditions

(mm)

DC	Mild steel ($\leq 180\text{HB}$) AISI 1010 etc.		Carbon steel, Alloy steel Gray cast iron AISI 1045, AISI 4140, AISI No 45 B etc.		Alloy tool steel (Low-hardness materials) Ferritic stainless steel Martensitic stainless steel AISI D2, AISI 430, AISI 420, AISI 440 etc.		Alloy tool steel ($\sim 40\text{HRC}$) AISI H13 etc.	
	n (min^{-1})	fr (mm/rev)	n (min^{-1})	fr (mm/rev)	n (min^{-1})	fr (mm/rev)	n (min^{-1})	fr (mm/rev)
1.0	7800	0.030	6000	0.030	3600	0.026	2400	0.018
1.2	6500	0.036	5000	0.036	3200	0.030	2000	0.022
1.6	5700	0.045	4400	0.045	2800	0.034	1760	0.024
2.0	5200	0.060	4000	0.060	2400	0.040	1600	0.030
2.5	4200	0.075	3200	0.075	1900	0.050	1280	0.037
3.2	3200	0.100	2500	0.100	1500	0.070	1000	0.050
4.0	2600	0.120	2000	0.120	1200	0.084	800	0.060
5.0	2100	0.150	1600	0.150	960	0.110	640	0.075
6.5	1600	0.180	1200	0.160	720	0.130	480	0.080
8.0	1300	0.200	1000	0.180	600	0.150	400	0.090
10.0	1000	0.240	800	0.220	480	0.180	320	0.110

- 1) Please reduce the revolution and feed rate depending on the drilling situation when the installation of workpiece or machine lacks rigidity.
- 2) Please use a collet type drill chuck or a milling chuck.
- 3) Use sufficient cutting fluid.
- 4) Depending on machining conditions, non-step machining may make chip ejection difficult, or cause chip elongation. In these cases, please use step processing. Step amount should be between DCx1 - DCx3.

The cutting conditions mentioned above are standard when using water soluble coolant.

Lower the revolution when insoluble cutting fluid is used.

If the revolution speed the intermediate diameter is not listed in the table, match it to the large diameter side and closest drill diameter conditions. Set the feed rate per revolution to a suitable value with the recommended feed rate of the closest drill diameter as the standard.

Memo

A series of horizontal dashed lines for writing, spanning the width of the page.



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VAPDJ

Violet High Precision Drill Series

For Your Safety

●Don't handle inserts and chips without gloves. ●Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage. ●Please use safety covers and wear safety glasses. ●When using compounded cutting oils, please take fire precautions. ●When attaching inserts or spare parts, please use only the correct wrench or driver. ●When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

 **MITSUBISHI MATERIALS CORPORATION**

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<http://www.mitsubishicarbide.com/en/>
(Tools specifications subject to change without notice.)